123-241

TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1883.

No. ~~872~~. 29

THE SMITH AND GRIGGS MANUFACTURING COMPANY, APPELLANT,

vs.

LEONARD A. SPRAGUE.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF CONNECTICUT.

FILED AUGUST 4, 1884.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1886.

No. 272.

THE SMITH AND GRIGGS MANUFACTURING COMPANY, APPELLANT,

vs.

LEONARD A. SPRAGUE.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF CONNECTICUT.

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1, 2, & 3 Circuit Court of the United States for the District of Connecticut.

LEONARD A. SPRAGUE

v.

THE SMITH & GRIGGS MANUFACTURING COMPANY.

Be it remembered that on the 26th day of June, 1884, in open court, being a day of the same term at which the final decree was made and entered in said cause, the following appeal and bond *was* filed, viz:

4 Circuit Court of the United States, District of Connecticut.
In Equity.

LEONARD A. SPRAGUE, Complainant and Appellee,

vs.

THE SMITH AND GRIGGS MANUFACTURING COMPANY, Defendant and Appellant.

To the honorable the Supreme Court of the United States:

The appeal of the Smith and Griggs Manufacturing Company, the above-named defendant and appellant, respectfully shows:

That on the 5 day of October, 1880, the above-named complainant filed his bill in the circuit court of the United States for the district of Connecticut against the above-named defendant, alleging infringement by it of three several letters patent of the United States, one numbered 228,136, granted May 25th, 1880, to the above-named complainant for improvement in machines for making buckle levers; a second numbered 230,156, granted July 20, 1880, to the above-named complainant for an improvement in buckle levers,
5 and a third numbered 231,199, granted August 17th, 1880, to the above-named complainant for an improvement in machines for making buckle levers.

The bill prayed for an injunction and for an account of the gains and profits received by the defendant, and of the damages sustained by the complainant by reason of said infringement, as by said bill of complaint will more fully appear, and said defendant, on the 22d day of January, 1881, filed its answer to said bill of complaint, admitting the issue of each of said letters patent to said complainant, as alleged in said bill of complaint, but denying that said several letters patent were lawfully issued and delivered, and also denying that the said defendant had infringed either of said letters patent, and alleging that the improvements patented in each of said letters patent were in public use and on sale in this country with the consent and allowance of the said complainant for more than two years before each of the applications were made by the said complainant for each of said several letters patent, and also alleging that the subject-matter of each of said letters patent was without prac-
6 tical importance and utility and not legally patentable, as by reference to said answer will more fully appear.

To which answer said complainant filed his replication on the 9 day of March, 1881, and the cause being at issue the parties proceeded to take testimony in support of their respective allegations, and at the April term of said circuit court, 1882, were fully heard by their counsel, and at the April term of said circuit court, 1882, an interlocutory decree for an injunction and account was rendered referring said cause to a master, and the case was continued for the master's report; and thereafter, at the September term of said circuit court, 1882, the master's report came in; to which said report said defendant made exceptions, which exceptions were duly argued before said circuit court.

That thereafter and at the April term of said circuit court, 1884, namely, on the 18th day of June, 1884, a final decree was made and pronounced in the cause, wherein it was ordered, adjudged, and decreed as follows:

At a stated term of the circuit court of the United States for the district of Connecticut, in the second circuit, held at Hart-
7 ford, on the 22d day of April, A. D. 1884.

Present: The Honorable N. Shipman, district judge.

LEONARD A. SPRAGUE

vs.

THE SMITH & GRIGGS MANUFACTURING COMPANY.

This cause having come on to be heard upon the report of Edwin E. Marvin, Esq., one of the masters of this court, to whom it was referred, to ascertain and report to the court an account of the number of machines for making buckle levers made or used by the said defendant, and the number of buckle levers made by the defendant thereon, and also the gains, profits, and advantages which the defendant has received, as well as all damages in excess of profits sustained by the complainant, which report bears date the 17th day of March, A. D. 1883, and also upon exceptions to said report on the part of said complainant, and also on the part of said defendant, and upon the equity reserved, and said cause having been argued by counsel and due deliberation had thereon, it is ordered,
8 adjudged, and decreed, and this court doth order, adjudge, and decree that the exceptions on the part of the defendant and the exceptions on the part of the complainant be overruled, and that the decision of the master be approved and adopted as the amount due from the defendant to the complainant upon said accounting.

And it is further ordered, adjudged, and decreed, and the court by virtue of the power and authority therein vested, doth order, adjudge, and decree, that the said defendant pay to the said complainant the sum of four thousand four hundred and eighty dollars and fifty cents, with interest from said 17th day of March, 1883.

And it is further ordered, adjudged, and decreed that the said defendant pay to the said complainant his costs in this suit, to be taxed, and that the said complainant have execution for such costs

and for the sum above decreed to be paid to said complainant as aforesaid.

N. SHIPMAN,
District Judge.

9 Whereupon said appellant appeals from the whole of said decree of said circuit court, and respectfully prays that the decree of said circuit court and the bill, answer, pleadings, depositions, evidence, and proceedings in the said cause may be sent to the Supreme Court of the United States without delay, and that the said Supreme Court will proceed to hear the said cause anew, and that the said decree of the said circuit court and every part thereof may be reversed, and a decree made reversing said decree, with costs, or such other decree as to the said Supreme Court may seem fit.

Dated at Hartford, Connecticut, this 26th day of June, A. D. 1884.

GEO. E. TERRY,
Sol'r for Defendant.

MUNSON & PHILLIPS,
Of Counsel.

Approved June 26, 1884.

N. SHIPMAN,
District Judge.

10 Supreme Court of the United States. In Equity.

LEONARD A. SPRAGUE
vs.
THE SMITH AND GRIGGS MANUFACTURING COMPANY.

Know all men by these presents that we, E. S. Smith and Geo. E. Terry, of Waterbury, in the State and district of Connecticut, are held and firmly bound unto Leonard A. Sprague in the sum of nine thousand dollars, to be paid to the said Leonard A. Sprague, his executors, administrators, or assigns, to which payment, well and truly to be made, we bind ourselves, and each of us, jointly and severally, and each of our heirs, executors, and administrators, firmly by these presents.

Sealed with our seals and dated this 26th day of June, 1884.

The condition of this obligation is such that whereas lately, at a circuit court of the United States holden at Hartford, within and for the district of Connecticut, on the 18th day of June, 1884, in

11 a suit in equity depending in said court, wherein Leonard A. Sprague was complainant and said The Smith and Griggs Manufacturing Company was defendant, a decree was entered against the said The Smith & Griggs Manufacturing Company, defendant, and the said defendant has, in due form of law, taken an appeal from said decree, to be holden at Washington on the second Monday of October next, for the purpose of reversing the said decree:

Now, if the said defendant shall prosecute its appeal to effect and answer all damages and costs if it fail to make good its said

appeal, then the above obligation is to be void; else to remain in full force and virtue.

EDW'D S. SMITH.
GEO. E. TERRY.

Witnesses:
E. E. MARVIN.
J. F. DONOHUE.

Approved.

N. SHIPMAN,
District Judge.

12 & 13 UNITED STATES OF AMERICA,
District of Connecticut:

At Hartford, in said district, on this 26 day of June, 1884, personally appeared the said E. S. Smith and Geo. E. Terry, who acknowledged the execution of the foregoing bond as their free act and deed.

E. E. MARVIN,
United States Commissioner.

14 Be it remembered that on the 5th day of October, 1880, there was filed in court a bill in equity in the words and figures following, viz:

United States Circuit Court, in and for the District of Connecticut.
Term, 1880. In Equity.

LEONARD A. SPRAGUE
vs.
THE SMITH AND GRIGGS MANUFACTURING CO. } No. —.

To the honorable judges of the circuit court of the United States in and for the district of Connecticut:

Leonard A. Sprague, of Brooklyn, E. D., in the county of Kings and State of New York, and a citizen of said State of New York, brings this bill against the Smith and Griggs Manufacturing Co., a manufacturing corporation organized and operating under the laws of the State of Connecticut, having its principal place of business at Waterbury, county of New Haven, State of Connecticut, and by virtue of its incorporation a citizen of said State of Connecticut.

And thereupon your orator complains and says that heretofore and before the 25th day of May, 1880, Leonard A. Sprague, of Brooklyn, E. D., in the county of Kings and State of New York, was the true, original, and first inventor of a certain new and useful improvement in machines for making buckle levers, not known or used before his invention thereof, and not for more than two years prior to the date of his application for a patent therefor in public use or on sale.

15 And your orator further shows unto your honors that the said Leonard A. Sprague, so being the inventor of said improvements, and being a citizen of the United States aforesaid, made application to the proper department of the Government

of the United States for letters patent, in accordance with the then existing laws of Congress, and having duly complied in all respects with the conditions and requisitions of said laws, on the 25th day of May, 1880, letters patent of the United States No. 228,136, signed, sealed, and executed in due form of law, for said invention, were issued and delivered to the aforesaid Leonard A. Sprague, whereby there was secured to him, and to his heirs, legal representatives, and assigns, for the term of seventeen years from the 25th of May, 1880, the full and exclusive right of making, using, and vending to others to be used, the said improvement.

And your orator further shows that a description or specification of the aforesaid improvement was given in the schedule to the aforesaid letters patent annexed, accompanied by certain drawings referred to in said last-mentioned schedule, and forming part of said letters patent. The said letters patent, and the said specification thereto annexed (which, or an exemplified copy of which, your orator will produce, as your honors may direct), were duly recorded in the Patent Office.

And your orator further complains and says that, on or before the twentieth day of July, in the year one thousand eight hundred and eighth, Leonard A. Sprague, of Brooklyn, E. D., New York, was the true, original, and first inventor of a certain new and useful improvement in buckle levers, not known or used before his invention hereof, and not, for more than two years prior to the date of his application for a patent therefor, in public use or on sale.

And your orator further shows unto your honors that the said Leonard A. Sprague, so being the inventor of said improvement, and being a citizen of the United States aforesaid, made ap-
16 plication to the proper department of the Government of the United States for letters patent in accordance with the then existing laws of Congress, and having duly complied in all respects with the conditions and requisitions of said laws, on the 20th day of July, 1880, letters patent of the United States No. 230,156, signed, sealed, and executed in due form of law, for his invention, was issued and delivered to the aforesaid Leonard A. Sprague, whereby there was secured to him and to his heirs, legal representatives and assigns, for the term of seventeen years from the 20th day of July, 1880, the full and exclusive right of making, using, and vending to others to be used, the said improvement.

And your orator further shows that a description or specification of the aforesaid improvement was given in the schedule to the aforesaid letters patent annexed, accompanied by certain drawings referred to in said last-mentioned schedule and forming part of said letters patent. The said letters patent and the said specification thereto annexed (which, or an exemplified copy of which, your orator will produce, as your honors may direct), were duly recorded in the Patent Office.

And your orator further complains and says that, on or before the seventh day of August, in the year one thousand eight hundred and eighty, Leonard A. Sprague, of Brooklyn, E. D., New York, was the true, original, and first inventor of a certain new and useful im-

provement in machines for making buckle levers, not known or used before his invention thereof, and not for more than two years prior to the date of his application for a patent therefor in public use or on sale.

And your orator further shows unto your honors that the said Leonard A. Sprague, so being the inventor of said improvement, and being a citizen of the United States aforesaid, made application to the proper department of the Government of the United States for letters patent in accordance with the then existing laws of Congress, and having duly complied in all respects with the con-
17 ditions and requisitions of said laws, on the 17th day of August, 1880, letters patent of the United States No. 231,199, signed, sealed, and executed in due form of law for said invention, were issued and delivered to the aforesaid Leonard A. Sprague, whereby there was secured to him, and to his heirs, legal representatives, and assigns, for the term of seventeen years from the 17th day of August, 1880, the full and exclusive right of making, using, and vending to others to be used, the said improvement.

And your orator further shows that a description or specification of the aforesaid improvement was given in the schedule to the aforesaid letters patent annexed, accompanied by certain drawings referred to in said last-mentioned schedule, and forming part of said letters patent. The said letters patent and the said specification thereto annexed (which, or an exemplified copy of which, your orator will produce, as your honors may direct) were duly recorded in the Patent Office.

And your orator further shows unto your honors that said several inventions are important and useful elements in the construction of a useful machine for making buckle levers; that they are so nearly allied in character as to be capable of conjoint as well as separate use in such apparatus, and as he is informed and verily believes they are so used by said defendant conjointly, as well as separately.

And your orator further shows that the owner of said patents has been at large expense of time, labor, and money in making said patented improvements profitable to himself and of benefit to the public, and has extensively applied the said several improvements to practical use, and has been, and but for the infringement hereinafter complained of your orator would still be, in the undisturbed possession, use, and enjoyment of the exclusive privileges secured by the said letters patent, and in the receipt of the profits of the same.

And your orator further shows unto your honors, as he is informed and believes, that the said defendant herein named,
18 well knowing all the facts hereinbefore set forth, is now constructing and using and vending the said patented improvements, or a machine in some parts thereof, substantially the same in construction and operation as in the said letters patent mentioned, the exclusive right and privilege to make and use which and vend the same to others to be used is thus by law vested in your orator.

And so it is, may it please your honors, that the said defendant, as your orator is informed and believes, without the license of your orator, against his will, and in violation of his rights, has made and used, and intends to continue still to make and use, the said improvements within the district of Connecticut, and refuses to pay to your orator any of the profits which it has made by such unlawful manufacture and use, or to desist from the further infringement of said recited letters patent; all of which acts and doings are in violation of the exclusive rights and privileges so as aforesaid vested in your orator under and by virtue of said recited letters patent, and are contrary to equity and good conscience, and tend to the manifest injury of your orator in the premises.

To the end, therefore, that the defendant may, if it can, show reason why your orator should not have the relief hereby prayed, and that it may make a full disclosure and discovery of all the matters aforesaid, and upon its corporal oath, and according to the best and utmost of its knowledge, remembrance, information, and belief, full, true, direct, and perfect answer make to the matters and things hereinbefore stated and charged, and particularly to such of the several interrogatories hereinafter numbered and set forth as by the note hereunder written they are required to answer—that is to say:

1. Whether the said original letters patent No. 228,136 hereinbefore mentioned was granted and issued to Leonard A. Sprague, as aforesaid.

2. Whether the said original letters patent No. 231,156
19 was granted and issued to Leonard A. Sprague, as hereinbefore mentioned.

3. Whether the said original letters patent No. 231,199 was granted and issued to Leonard A. Sprague, as aforesaid.

4. Whether the said defendant, or either and which of them, have at any time, and when and during what period of time, made, used, or sold any and how many machines for making buckle levers constructed in whole or in part upon the principles and in the manner described in said letters patent Nos. 288,136, 231,156, 231,179, granted to your orator as aforesaid.

5. Describe minutely and in detail their construction and operation.

And that the said defendant may answer the premises, and that it may be decreed to account for and pay over the income or profits thus unlawfully derived, or which might have been derived, from the violation of the rights of your orator as aforesaid, your orator prays that your honors, upon entering the decree in favor of your orator against said defendant for infringement as above prayed for, may also proceed to assess, or cause to be assessed, under your directions, as well the profits or income to be derived therefrom, to be accounted for as aforesaid, as also in addition thereto the damages sustained by your orator by reason of such infringement, and that your honors may increase the actual damages so assessed to a sum equal to three times the amount of such assessment under the circumstances of the wilful and unjust infringement committed by said defendant as hereinbefore set forth; and, further, that the

said defendant may be restrained from any further violation of the rights of your orator as aforesaid, your orator prays that your honors may grant a writ of injunction issuing from and under the seal of this honorable court, or issued by one of your honors, perpetually enjoining or restraining the said defendant, its clerks, attorneys, servants, agents, and workmen, from any further construction
20 or sale or use in any manner of said patented improvements, or any part thereof, in violation of the rights of your orator as aforesaid. And your orator further prays that a provisional or preliminary injunction be issued, restraining the said defendant from any further infringement of said recited letters patent pending this cause, and it prays for such other relief as equity of the cause may require and to your honors may seem meet.

May it please your honors to grant unto your orator not only a writ of injunction conformable to the prayer of this bill, but also a writ of subpœna of the United States of America, directed to the said Smith and Griggs Manufacturing Company, commanding it on a day certain therein to be named to appear and answer unto this bill of complaint, and to abide and perform such order and decree in the premises as to to the court shall seem meet and may be required by the principles of equity and good conscience.

LEONARD A. SPRAGUE,
Complainant.

STATE OF NEW YORK, }
City and County of New York, } *ss:*

Before me, the subscriber, duly authorized to administer oaths, personally came Leonard A. Sprague, the complainant in the foregoing bill named, who, being duly sworn, deposes and says that so far as the statements herein contained are within his own knowledge they are true, and so far as they are derived from the information of others he verily believes them to be true; and he further says that he verily believes himself, the said Leonard A. Sprague in said bill named, to be the original, true, and first inventor of the new and useful improvements which are described in the letters patent granted to him and mentioned in the foregoing bill; and, further, that the said deponent verily believes that the title of the said complainant as is set forth in said bill is true.

LEONARD A. SPRAGUE.

Sworn and subscribed before me this 2d day of October, A. D. 1880.

[NOTARIAL SEAL.] EDWARD C. GRAVES,
Notary Public, 106, *City and County of New York.*

21 And on the same day a writ of subpœna issued out of court, directed to the said respondent, which was duly served and returned, and which, with the return of service endorsed thereon is in the words and figures following, viz:

22 [SEAL.] The President of the United States of America to the marshal of the district of Connecticut sendeth Greeting:

You are hereby commanded to summon The Smith & Griggs Manufacturing Company, a corporation organized under the laws of the State of Connecticut, and located and doing business in the city of Waterbury, in the State and district of Connecticut, to appear before the judges of the circuit court of the United States of America for the district of Connecticut, in the second circuit, in equity, on the first Monday of November, 1880, wheresoever the said court shall then be, to answer a bill of complaint exhibited against said respondent in said court by Leonard A. Sprague, of the city of Brooklyn, in Kings county and the State of New York, and then and there to answer the same, and to do and abide by what said court may order and decree in the premises.

Make due service and return at least twenty days before said first Monday of November, 1880.

Witness the Hon. Morrison R. Waite, Chief Justice of the Supreme Court of the United States, at Hartford, this 5th day of October, A. D. 1880.

E. E. MARVIN, *Clerk.*

The defendant is required to enter its appearance in said cause in the clerk's office of said court on or before the day at which this writ is returnable, or by the rules of said court said bill will be taken as confessed.

E. E. MARVIN, *Clerk.*

H. H. DOUBLEDAY,
Washington, D. C., Complainant's Solicitor.

22½ UNITED STATES OF AMERICA,
District of Connecticut, New Haven County, } *ss:*

WATERBURY, *Novem. 7th,* 1880.

Then and there I served the within writ on The Smith & Griggs Manuf'g Co. herein named, by delivering to and leaving with E. S. Smith, the secretary of the defendant corporation herein named, a true and attested copy hereof.

Attest:

JOS. D. BATES,
U. S. Marshal.

Fees:

Service	$2 00
Copy	1 00
Travel	4 20
Hack	1 25
	$8 45

[Endorsed:] No. 317. United States circuit court, district of Connecticut. In equity. Leonard A. Sprague against The Smith & Griggs Manufacturing Company. Writ of supœna. Issued October 5th, 1880. Returnable November rule-day, 1880.

23 And on the same day H. H. Doubleday, Esq., entered his appearance for the complainant, and on the 18th day of November, 1880, John S. Beach, Esq., entered his appearance for the defendant, and on the 22d day of January, 1881, defendant's answer was filed in the words and figures following, viz:

24 *Answer.*

United States Circuit Court, District of Connecticut. In Equity.

LEONARD A. SPRAGUE
v.
THE SMITH & GRIGGS MANUFACTURING CO. } No. 317.

The answer of The Smith & Griggs Manufacturing Company, defendants, to the bill of complaint of Leonard A. Sprague, complainant.

This defendant, reserving all right of exception to said bill of complaint, for answer thereto, says:

I. They admit, upon information and belief, that letters patent of the United States were issued to said Leonard A. Sprague May 25, 1880, July 20, 1880, and August 17, 1880, respectively, for alleged improvement in machines for making buckle levers, and for alleged improvements in buckle levers, as alleged in said bill, but deny that said several letters patent were so lawfully issued and delivered, or that said improvements had not been in public use or on sale for more than two years before his application for said several patents, or that he was the original and first inventor of the alleged improvements described and claimed in said several patents, or that he
25 obtained any exclusive right or liberty by virtue of said patents.

II. They say, on information and belief, that the said alleged improvements described in said several letters patent, or a substantial and material part thereof claimed in said several letters patent as new, was, before the alleged invention thereof by the said Sprague, known to and used by Edward S. Smith, of Waterbury, Conn.; —— Jordan, of Brooklyn, New York, and divers other parties, whose names and residences are at present unknown to the defendant, who reserves the right within the time by law allowed to amend this answer by inserting the names and residences of such persons when they shall be ascertained by the defendant, as well as sundry letters patent of the United States and of Great Britain, which by such amendment will be particularly pointed out.

III. They say, on information and belief, that each and all of the improvements so patented to the said Sprague, as alleged in said bill, were in public use and on sale in this country with his consent and allowance more than two years before his application for said several letters patent.

IV. They say that so far as the particular construction of
26 buckle levers or machines for making buckle levers, described and shown in the said several patents, are to be distinguished

from the construction of buckle levers or machines for making buckle levers previously known or used or described in patents of the United States, such distinction is without practical importance or utility and not legally patentable.

V. They deny that they have at any time used the said alleged patented inventions, or either of them, and deny the infringement with which they are charged.

VI. They deny each and every item, allegation, and particular in said bill of complaint set forth which has not hereinbefore been either admitted or denied specifically. Wherefore they submit for the reasons hereinbefore set forth that they ought not to be decreed to account for and pay to the complainant any damages or profit whatsoever, nor be enjoined as prayed for in said bill, but, on the contrary, submit that said complainant is not entitled to any relief whatever against them; all which your defendant is ready to maintain and prove as this honorable court shall seem fit, praying that they may be hence dismissed with their reasonable costs and charges in this behalf most wrongfully sustained.

27 THE SMITH & GRIGGS M'F'G CO.,
By EDW'D S. SMITH, *Sec'y.*

JOHN S. BEACH,
GEO. E. TERRY,
Solicitors and of Counsel.

DISTRICT OF CONNECTICUT, }
County of New Haven, } *ss:*

At Waterbury, this 1st day of December, A. D. 1880, personally came Edward S. Smith and made oath that he is the secretary of The Smith & Griggs M'f'g Co., the above-named defendant corporation; that he has read the foregoing answer by him subscribed, and that the same is true, save as to those matters therein stated to be on information and belief, and as to those matters he believes them to be true.

Before me—

GEO. E. TERRY,
U. S. Commissioner, Dist. of Conn.

28 And on the 9th day of March, 1881, Messrs. Mitchell & Hungerford entered their appearance for the defendant, and on the same day complainant's replication to said answer was filed, in the words and figures following, viz:

29 United States Circuit Court, District of Connecticut. In Equity.

LEONARD A. SPRAGUE
vs. } No. —.
THE SMITH AND GRIGGS MANUFACTURING CO.

The replication of Leonard A. Sprague, complainant, to the answer of The Smith and Griggs Manufacturing Co., defendant.

This repliant, saving and reserving to himself all and all manner

of advantage of exception to the manifold insufficiencies of the said answer, for replication thereunto says that he will aver and prove his said bill to be true, certain, and sufficient in the law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by this repliant, without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, confessed, and avoided, traversed or denied, is true; all which matters and things this repliant is and will be ready to aver and prove, as this honorable court shall direct; and humbly prays as in and by his said bill he has already prayed.

C. E. MITCHELL,
Solicitor for Complainant.

29½ And on the 8th day of June, 1882, complainant's and defendants' evidence was filed in the words and figures following, viz:

30 United States Circuit Court, District of Connecticut. Sept. Term, 1881. In Equity.

LEONARD A. SPRAGUE, Complainant,
vs.
THE SMITH AND GRIGGS MANUFACTURING CO. } No. 317.

Proofs on behalf of complainant for final hearing taken by consent before J. Homer Hildreth, a notary public, in lieu of a U. S. examiner, at 265 Broadway, N. Y. city, N. Y., under rule 67, as amended.

Present and consenting thereto: Chas. E. Mitchell, on behalf of complainant, and Geo. E. Terry, on behalf of respondent.

Deposition of H. H. Doubleday.

H. H. DOUBLEDAY, a witness on behalf of complainant, being first duly sworn, upon his oath, in answer to interrogatories and cross-interrogatories, did depose and say:

Ques. 1. What is your name, age, residence, and occupation?

A. Henry H. Doubleday; 47 years of age; reside in Washington, D. C.; solicitor of patents by profession.

Q. 2. State what experience you have had in comparing mechanism with each other, and with letters patent, referring especially to any knowledge you may have of the act of making buckles, and of machines relating thereto.

A. I have been engaged in the prosecution of applications for letters patent for about 15 years last past, during which
31 time I have devoted considerable attention to making investigations for the purpose of determining not only the patentability of inventions, but as to whether certain machines infringed particular letters patent or any existing letters patent, and in the preparation of opinions concerning such infringement. I prepared

and prosecuted the applications upon which letters patent Nos. 228,136 and 231,199, to L. A. Sprague, for machines for making buckle levers, were granted. I also prepared a number of applications for reissue of patents covering similar buckle levers for that same L. A. Sprague, which work directed my attention particularly to the class of machinery used for making buckle levers and similar articles.

Q. 3. State what experience you have had in testifying as an expert in U. S. courts in patent causes.

A. I have testified in such cases as an expert, and have had considerable experience in that capacity.

(Counsel for complainant places in evidence a certified copy of letters patent No. 228,136, dated May 25, 1880, to Leonard A. Sprague for improvements in machines for making buckle levers, which is marked Exhibit Sprague Patent No. 1; also a certified copy of letters patent No. 231,199, dated August 17, 1880, to Leonard A. Sprague for improvement in machines for making buckle levers, which is marked Exhibit Sprague Patent No. 2. J. H. H., notary, etc.)

Q. 4. If you say that you have read and understand letters patent No. 228,136 and No. 231,199, to Leonard A. Sprague, just placed in evidence, state whether they relate to improvements in the same machine.

A. Yes; I have read and think I understand these patents. They both relate to one and the same machine, the application for the later patent—Exhibit Sprague Patent No. 2—being a division of the application upon which the Exhibit Sprague Patent No. 1 was granted.

32 Both applications were based upon the same model, and both were pending at the same time in the Patent Office, although it is stated in the earlier patent, at line 50, page 5, that the applicant is "preparing to file" another application; yet that language was intended to refer, and did refer, to the application upon which the 2nd patent was granted, having been inserted in the specification of patent No. 1 some time before the patent was granted.

Q. 5. Describe, generally, the construction and mode of operation of the machine set forth in the two Sprague patents, to which your attention has been directed.

A. In the complainant's patented machine the brass is fed in in a continuous narrow strip or ribbon by a reciprocating feeder and delivered upon a bed-plate and underneath a reciprocating punch, the first downward movement of which punches two elongated holes or slots in the ribbon, at some distance apart; the punch then rises and, while it is up, the feeder thrusts the ribbon forward a suitable distance, when a second reciprocating punch comes down and strikes out the blank having in it the two slots, forcing said blank through a throat in the bed-plate corresponding in size and outline to the size and outline of the punch in cross-section, thus forming a blank, which is to be subsequently swaged and bent into the requisite shape. I here present one of these Sprague blanks.

(Counsel for complainant places same in evidence, and requests it be marked "Sprague Flat Blank," which is done accordingly. J. H. H., notary, etc.)

This flat blank passes through the bed-plate and falls flat upon the surface of a plate, whence it is pushed a short distance onto the upper face of a matrix; it is pushed upon this matrix by means of a horizontally reciprocating carrier, the movement of which is so timed as to push the flat blank upon the matrix shortly after the punch moves upward.

33 A folder, consisting of a comparatively thin flat blade, now descends, and, striking a flat blank near its centre, forces it down into the throat of the matrix, thus bending it into a U-shape. I have one of these U-shapes and here present it.

(Counsel for complainant offers it in evidence, and same is marked "Sprague U-shaped Blank." J. H. H., notary public, etc.)

After the reciprocating folder is withdrawn from the matrix the U-shaped blank is pushed endwise out of its seat in the matrix and thrust onto the end of a mandrel by means of a part of the same carrier which pushed the flat blank upon the matrix. Although it is a part of the same carrier it is not that part of the carrier which engaged with the flat blank to push it upon the matrix. The mandrel consists, substantially, of a flat bar, having ribs upon it and provided at one edge with a projecting lip or shank, by means of which it is properly supported, with its sides upon lines substantially parallel with the side walls of the throat of the matrix, so that when the U-shaped blank is pushed from the matrix onto the end of the mandrel the blank moves in a right line and without any change of direction of travel. In order to insure that the U-shaped blank shall remain in proper position relative to the mandrel while the next bending or swaging operation is being performed there are two stops employed, one of which is arranged a short distance from the edge of the mandrel, and engages with or receives the closed end of the U-shaped blank, the other being arranged to receive and engage with one of the open ends of the U-shaped blank.

A pair of dies are now advanced, one on either side of the mandrel and the blank, on lines substantially at right angles to the flat sides of the U-shape and of the mandrel. These dies have their engaging faces—that is, the faces which engage with the U-shaped blank—of such form or contour that when acting upon the U-shaped

34 blank, in combination with the mandrel, they bend or swage it into the form represented by the partially-formed lever which I now present.

(Counsel for complainant offers it in evidence, and same is marked "Sprague Exhibit Partially Formed Lever." J. H. H., notary public.)

These reciprocating dies are now withdrawn, their withdrawal being simultaneous with the upward movement of the former and the punching dies, and while they are thus withdrawn the carrier advances, and in so advancing does three things simultaneously:

First, it pushes a flat blank onto the matrix; secondly, it pushes a U-shaped blank out of the matrix and upon the mandrel; and, thirdly, by reason of the U-shaped blank engaging with the partly formed lever, it advances this partly formed lever upon the mandrel, pushing it between the opposing faces of a second pair of reciprocating dies which are so actuated as to advance and engage with this partly formed lever at the same time that the first-named pair of dies engage with and act upon the U-shaped blank, and that the folder forces a flat blank down into the throat of the matrix, and that one punch is punching a blank from the ribbon and that the other punches are punching the slots in that part of the ribbon from which a flat blank is to be punched.

All the punches and dies are now advanced substantially simultaneous, thus performing five operations at substantially the same time—that is to say, punching the slots, punching the blank from the ribbon, bending the flat blank into the U-shaped blank, bending the U-shaped blank into the partially formed lever, and completing a lever, this last operation being performed by the last pair of dies in the series, which, as they advance, operate in combination with ribs on the mandrel to form grooves in the outer ends of the legs of the lever, thus producing a completed lever like the one which I now present.

35 (Counsel for complainant offers in evidence the article produced, and the same is marked "Sprague Exhibit Completed Lever." J. H. H., notary public.)

When it is desired to make notches in the biting edges of the bit of the lever a series of small punches are inserted in the stock which carries the punches for punching the slots, these additional punches being arranged to punch a series of holes on a line parallel to the slots and about midway between them, so that when the blank is folded back upon itself the line of the fold intersects the series of holes, thus forming the desired notches which assist in griping the leather or other material to which the buckle is applied.

After the completed lever, like Sprague Exhibit Completed Lever, is finished, a repetition of the operation by which it was produced advances it upon the mandrel in the same direction in which it has been moving, until it reaches the end of the mandrel, when it drops off.

Q. 6. State whether you have examined a machine for making buckle levers in operation at the factory of the defendants at Waterbury, Conn., and if so, when it was.

A. Yes; I examined a machine of that character at the factory of defendants, The Smith and Griggs Manufacturing Company, Waterbury, Conn, during the month of May or June, 1880.

Q. 7. Please describe the construction and mode of operation of that machine, and its leading features.

A. It was so constructed that a narrow strip or ribbon of brass was fed by means of a vibrating feeding mechanism over a bed-plate which had, a short distance from the feeding mechanism, two slots

or throats in it. There were two punches arranged to reciprocate vertically and enter the slots, so that in their downward movement they would punch two slots a short distance apart in the strip of brass. The feeding mechanism was so timed that while these punches were raised above the ribbon after they had punched
36 the slots in it the ribbon would be moved forward over another slot in the bed-plate of the size which it was desired to make the blank; after which a vertically reciprocating punch, of the same size and shape in cross section as the slot over which the ribbon was placed, came down and punched out a blank which had near its ends the two slots that had been punched by the first-mentioned two punches. I did not bring with me any samples of these blanks, but they were substantially the same as the Sprague Exhibit Flat Blank.

These flat blanks, after passing through the throat in that bed-plate, fell flat upon a surface prepared to receive them, and were immediately pushed over a matrix—that is, they were pushed onto the upper surface of a matrix by means of a reciprocating carrier. The movement of this carrier was so turned as to thrust that flat blank forward upon the matrix shortly after the punches commenced making their upward movement, and after the flat blank was in proper position on the matrix the vertically-reciprocating folder or folding blade came down, and taking the flat blank at about its centre forced it down into the throat of the matrix, thus bending it into a U-shaped blank, the curve or bend of the U being driven into the bottom of the groove of the matrix, its legs sticking up along the sides of the throat. While this operation of bending a flat blank into a U-shaped blank was being performed, the punches before referred to were punching out a new blank from the ribbon, the punches and former reciprocating simultaneously. I did not bring from that factory any samples of the U-shaped blank, but they were substantially like "Sprague's Exhibit U-shaped Blank."

In that Smith and Grigg Manufacturing Company's machinery the matrix was formed in the upper end of a block of metal, which, at its lower end, was mounted on trunnions, and was operated by means of a cogged rack, which, at regular intervals, oscillated the matrix about its trunnions from a vertical to a horizontal posi-
37 tion, and after the folder had been withdrawn from the matrix, leaving the U-shaped blank in the throat of the matrix, the cogged rack turned the matrix down into a horizontal position, so that its throat and the U-shaped blank were directly opposite to the end of a mandrel. This mandrel consisted of a flat bar having a rib at one edge, and a second rib upon each side a short distance from the rib on the edge, these two ribs not extending, however, the entire length of the mandrel, but commencing about the width of the U-shaped blank from that end of the mandrel which was adjacent to the matrix. A carrier pushed the U-shaped blank out of the matrix and upon the end of the mandrel, the walls of the throat in the matrix and the sides of the mandrel being in substantially parallel planes, so that when the U-shaped blank was pushed out of the matrix and upon the end of the mandrel it moved in a practically

straight line and on a right line with the path traveled by the carrier during its reciprocation. There were in that machine two stops, one being at a short distance from that edge of the mandrel which had the rib in it, the closed or bent end of the U-shaped blank engaging with this stop, the other stop being placed at or near the opposite side of the mandrel, so that the end of one of the legs of the U-shaped blank would engage with it. Thus the position of the U-shaped blank relative to the mandrel was determined by these stops.

In that machine there were two dies, one on either side of the mandrel opposite to this U-shaped blank; one of the dies, the lower one, being stationary in close proximity to the mandrel, the other die, the upper one, reciprocating vertically; the opposing faces of these dies having a configuration the reverse of that part of the mandrel occupied by the U-shaped blank, and having also portions of their surfaces adapted to form the bit of the buckle lever. As soon as the U-shaped blank was placed on the mandrel the upper movement die descended, and by means of this die, the lower stationary die, and the mandrel, the U-shaped blank had formed
38 in it two semi-circular grooves about midway of its length, and also had a bit formed at its closed end. I did not bring with me any samples of the part thus produced, but it was substantially like the "Sprague Exhibit Partially Formed Lever."

The upper movable dies were then withdrawn, and at the same time the folder and the punching dies moved upward substantially simultaneously, immediately after which a new U-shaped blank was thrust from the matrix upon the end of the mandrel by a carrier. There were three movements of the partly formed blanks performed simultaneously. First, the flat blank is pushed upon the matrix; secondly, the U-shaped blank was pushed out of the matrix and into the end of the mandrel; and, thirdly, that U-shaped blank engaged with the partly formed blank which was already on the mandrel, and advanced it, the rib on the end of the mandrel serving to maintain the partly formed lever in proper position upon the mandrel for being acted upon by the next dies, which were so constructed that they acted upon the partially finished blank at the same time that the first-described pair of dies act upon the U-shaped blank, that the former bends the flat blank into the U-shaped, and that the punches punch slots into the ribbon, and punch the flat blank from the ribbon.

Adjourned by consent to October 15th, 1881, 9 a. m., same place.

And now, at 9 o'clock a. m., this 15th October, 1881, examination of H. H. Doubleday in chief continued, parties present as before, to wit:

At this time the folder, and the punches, and the dies were all elevated above the metal with which they were to engage, and as they descended substantially simultaneously, thus performing five operations at one and the same time, to wit:

1st. Punching the slots in the ribbon.
2nd. Striking out the flat blank having slots near its ends.
3d. Bending the flat blank by means of the folder, thus forming the U-shaped blank.
39 4th. Bending the U-shaped blank into the partially formed lever by means of the first-described reciprocating die, the opposing stationary die, and that portion of the mandrel which was located between the dies; and—
5th. Forming the grooves in the ends of the legs of the lever, thus forming a completed lever by the joint operation of the second and last reciprocating die, its opposing stationary die, and a portion of the mandrel which has upon it the second pair of ribs (one upon either side) which I have described as extending only a portion of its length.

I did not bring with me any samples of those completed levers, but they were substantially like "Sprague's Exhibit Completed Lever," and like the lever which I here present, and which I believe to be identical in structure with those which I saw produced by the machine in the manufactory of the defendant's company—the Smith and Griggs Manufacturing Company. I observe that this lever is marked Smith and Griggs.

(Counsel for complainant offers the lever referred to by the witness in evidence, and requests the notary to mark the same Complainant's Exhibit "The Smith and Griggs Manufacturing Company Completed Lever," which is done.)

The upper movable dies, the folder, and the punches were then moved upward with a substantially simultaneous throw, immediately after which another U-shaped blank was pushed out of the matrix and upon the end of the mandrel, which, as I have stated, was arranged on a line substantially parallel with the side walls of the throat in the matrix when the matrix was in a substantially horizontal position, to which it was rotated after the flat blank had been pushed down into it and the folder had been withdrawn. There were three substantially simultaneous movements of the partially formed blank as it was advanced toward completion in that machine:
40 1st. The flat blank was pushed onto the matrix into position to be bent by the folder; 2d, the U-shaped blank moved out of the matrix upon the end of the mandrel; and, 3d, this U-shaped blank pushed the partly formed lever along on the mandrel into position to be acted upon by the final pair of dies, the central grooves clasping the rib of the lower edge of the mandrel, so that in the absence of other guides the rib would serve to direct the partly formed lever to a proper position for being acted upon by the last pair of dies. A repetition of these operations pushed the completed lever along the mandrel until it reached its end, where it dropped off.

Q. 8. Compare the mechanism of defendant's machine which you have described with the mechanism of the machine described in the two Sprague patents in suit, and specially referred to in the first

claim of letters patent 228,136, and if you say that you find in defendant's machine the subject-matter of said claim give your reasons.

A. I have made the comparison required by the question, and find that the defendant's machine does contain the construction described and claimed in the first claim of the said Sprague patent No. 228,136, as I understand it. That claim covers the combination of three elements, the first of which is a mandrel having a peculiar construction by reason of which it is adapted not only to form, when used in combination with suitable dies, a buckle lever of a peculiar figuration, but also by reason of the presence of a peculiarly shaped rib to serve as a guide or support over which the partially formed lever may be moved to a certain position, between two other dies, which, when acting in combination with other ribs on the mandrel, will produce additional grooves near the ends of the legs of the lever, without necessitating the employment of guides to engage with ends of the partly formed lever during its movement from between the first pair of dies to the second pair of dies.

41 The peculiar configuration or structure of the mandrel which adapts its specially for use in a buckle machine, consists of a flat comparatively thin portion with a rib projecting in both directions from one edge *oval* the cross-section with two other semi-circular ribs lying parallel with the first-named rib. These ribs being marked respectively *m* m^2 on the mandrel M in the drawings of the Sprague patent, No. 228,136, the structure of the mandrel being shown more particularly in figures 1, 7, 8 of the said Sprague patent. The other two members in the combination are the two pairs of dies, which, acting in combination with the mandrel, bend and swage the U-shaped blank into the proper shape.

One of these pairs of dies marked N N′ is constructed each with a central groove corresponding to the part of the rib on the edge of the mandrel against which it is designed to compress the metal for the purpose of forming in the lever a seat to receive the central bar of the buckle frame, the grooves being marked *n nx* in figure 7 of the Sprague drawings of patent No. 228,136.

Each of these dies is recessed to form the closed end of the U-shaped blank into a griping bit adapted to press the strap to which the buckle is applied firmly against one of the bars of the buckle frame.

The other pair of dies O O has in addition to the above-described grooves and recesses additional grooves marked *o o* in figure 8 of said Sprague drawings patent 228,136, adapted to press the metal around the ribs small n^2 of the mandrel, thereby forming small grooves near the end of the legs of the lever.

It is apparent from an examination of the Sprague patent 228,136 that from the fact that the grooves u^2 u^3, figures 11 and 12, fit closely the rib small *m* on the edge of the mandrel, the partially formed lever will be guided while being moved from the first pair of dies N N′ to the second pair of dies O O, even though no guides be employed at the ends of the partly formed lever.

42 Now, in that defendant's machine, as I saw it in operation at Waterbury, Conn., as above referred to, there were used two pairs of dies corresponding substantially to the dies N N′, O O, and a mandrel corresponding substantially to the Sprague mandrel M, and having on it a rib like the rib *m* and two shorter ribs like the ribs m^2 in that Sprague patent.

The mandrel was arranged between the dies and in the same relation thereto as in the Sprague patent, and when the machine was in operation the dies operated upon the U-shaped blank, and bent and swaged it into a partly formed lever, which was afterwards pushed along the mandrel between the second pair of dies where the grooves were formed near the ends of the legs, thus completing the lever.

Thus I find in that defendant's machine the elements which are recited in this first claim of the Sprague patent 228,136, each of the elements being constructed in substantial accordance with the said patent, and combined to operate in substantially the same manner, and to produce the same results. In making this answer I have not overlooked the fact that in the defendant's machine one of the dies in each pair, respectively, was stationary instead of movable, as in the Sprague patent; nor of the fact that the dies reciprocated vertically instead of horizontally, as in the Sprague machine; but I regard these differences as being merely formal and not material, because they did not in any essential particular modify the operation of the machine or the result produced.

Q. 9. Compare the mechanism of defendant's machine with the Sprague machine, referring specially to the combination of parts specified in the third claim of letters patent 228,136, and if you find such combination in the defendant's machine give your reasons.

A. I do find upon examination that the defendant's machine contained the invention set forth in that third claim, which covers, as I understand it, the combination of four instrumentalities: 1st,

43 a mandrel of such an outline in cross-section as will enable dies, when acting in combination with it, to impart the desired configuration to the lever; 2d, a punching mechanism adapted to strike a suitably shaped blank from a thin sheet of metal; 3d, a series of dies, whether they be two, three, or more, adapted, when used in combination with the mandrel, to impart to the blank the desired configuration by a series of bendings or bendings and swagings; and, 4th, a carrier which operates to feed the blank to the first of the series of bending dies and also moves forward the blanks to receive the successive bends, the blanks being advanced during a portion of their manipulation by reason of the end of one of them being thrust against the end of the preceding one in the series.

In the Sprague patent 223,136 the mandrel is marked M *m* m^2; the punch which strikes the blank from the sheet metal is marked C^2; the group of dies which form the 3d element in the combination consists of the matrix L, folder *l*, and the two pairs of dies N N′, O O, which, by their sequence of operations in combination with the mandrel, bend and swage the blank into the completed buckle lever. The 4th element in the combination is the carrier marked I *i i′*.

It is seated in a groove in the bed-plate and has a reciprocating motion imparted to it, its line of reciprocation being parallel with the sides of the mandrel and with the walls of the throat in the matrix. Its upper face is a little below the upper face of the plate upon which the flat blank falls from the punch, and it carries a transverse plate, *i'*, which at each reciprocation engages with the flat blank and pushes it onto the matrix beneath the folder.

Another part of this carrier, marked *i* in the Sprague drawings, extends beyond or in advance of this transverse plate. This projecting end *i* at each reciprocation passes through the throat of the matrix, the sides of whose throat it fits closely, so that at each
44 reciprocation it (the projecting end) pushes a U-shaped blank out of the matrix and onto the end of the mandrel.

Thus, although the Sprague carrier is made in one piece of metal, it has two separate and distinct engaging portions or pushers, the functions of which are separate and distinct from each other, the one, the transverse plate *i'*, acting to push a flat blank from beneath the punch over onto the upper face of the matrix; the other, the projecting end *i*, serving to thrust the U-shaped blank out of the matrix onto the end of the mandrel, and, by reason of the U-shaped blank engaging with the rear end of the preceding partially formed lever, advancing such partially formed lever to the next pair of dies in the series, such partially formed lever sliding in the mandrel.

It will be understood from examining the patent that the projecting end, small *i*, of the carrier, the U-shaped blank, the partially formed lever, and the completed levers, if there be any on the mandrel, all travel during their progress through the machine from the matrix to the opposite end of the mandrel on a line coincident with the line of reciprocation of both parts, *i i'*, of the carrier.

In the defendant's machine I found what I understand to be substantially the same combination of devices as that which I have just described: 1st. There was a punch which struck the blank from a thin sheet of brass. 2d. There was a series of dies, consisting of a matrix and a folder, which bent the blank into U-shape, and two other dies which successively formed the U-shaped blank into a partially completed and a completed lever, the lever in its successive stages assuming the shapes represented by Sprague's Exhibits U-Shaped Blank, Partially Completed Lever, and Completed Lever. 3d. There was a mandrel corresponding substantially to the mandrel marked M *m* m^2 in the Sprague patent, such mandrel being arranged in the same position substantially relative to the dies, including the matrix when the U-shaped blank was being pushed from the matrix onto the mandrel. 4th. There was also
45 in that machine of the defendant a pusher, or carrier, which thrust the flat-blank from the position in which it fell from the punch over onto the matrix in proper position below the folder. There was also a pusher, which, when thrust forward, passed through the throat of the matrix and in close contact with its walls, thereby pushing out the U-shaped blank which had been formed therein by the folder, thrusting said blank onto the end of the mandrel, which blank engaged with a partially

formed lever which was on the mandrel between the first pair of dies, and advanced it (the partially formed lever) to a proper position to be acted upon by the next pair of dies.

The partly formed lever during this movement slid along the mandrel.

In that defendant's machine the pusher which thrust the U-shaped blank out of the matrix and onto the mandrel reciprocated in a right line, said line being coincident with or parallel to the side walls of the throat of the matrix and the sides of the mandrel so that the partially bent or partially formed levers and the completed levers on the mandrel, as they traveled through the machine, all moved on a substantially straight line, which line was coincident with or parallel to the line of travel of the pushers the same as in the Sprague machine.

Each of the elements of that third claim I found in the defendant's machine, and I found them to be substantially the same in their construction, in their arrangement relative to each other, in their mode of operation at each successive step, and in the result produced, as are the same parts in the Sprague patent No. 228,136.

In making this answer I keep in mind that in addition to the differences in the construction between the defendant's machine and that set forth in the Sprague patent, which I have heretofore
46 described, there were differences in the carrier in the matrix and in the position of some of the parts, as follows:

In the Sprague patent the matrix is stationary, and the side walls of its throat always remain vertical, or nearly vertical. The sides of the mandrel and the faces of the dies N N′ O O are also vertical, the dies reciprocating on horizontal lines, while in the defendant's machine the matrix was mounted on trunnions, and, after the folder was withdrawn, was oscillated through an arc of about 90 degrees, so that the walls of its throat occupied about a horizontal position carrying with it a U-shaped blank.

There was a corresponding change in the position of the mandrel and dies—that is to say, the mandrel was in a horizontal position, with the stationary dies below it and the vertically-reciprocating dies above it; but the relative position of these parts—that is, the matrix, the mandrel, the dies on each side of the mandrel, and the pusher or carrier, while the U-shaped blank was being thrust out of the matrix and into the end of the mandrel—was the same in that defendant's machine as is the position of the corresponding parts in the Sprague patent.

So, also, the operation of the parts of that defendant's machine which are embraced in that third claim of the Sprague patent was substantially the same as the operation of the corresponding parts in the Sprague patented machine. Hence I regard these differences which exist as being merely formal ones.

There is one feature of that defendant's machine about which I am in doubt.

I am not clear in my recollection whether the two pushers or carrier parts were made in one piece of metal or were made and mounted separately, and were operated by means of separate con-

nections and cams on the driving-shaft, or other equivalent devices.

But I regard that question as having no significance or bear-
47 ing upon the matter or claim under consideration, because in the defendant's machine both pushers or parts of the carrier moved practically simultaneously upon parallel lines, acted upon the same parts of the incomplete and completed buckle levers at the same stages of punching and bending, and with the same result as do the corresponding parts in the Sprague patented machine.

Q. 10. Compare the mechanism of defendant's machine with the Sprague machine, referring specially to the combination of parts specified in the fourth claim of letters-patent 228,136, and if you find such combination in the defendant's machine give your reasons.

A. I have made the desired examination and am of the opinion that the defendant's machine, when I saw it, did contain the combination of devices which is embraced in that fourth claim.

That machine contained devices which corresponded to each and every of the parts of the Sprague patented machine, which are designated by letter in the fourth claim. The matrix and folder were identical in their structure and operation so far as relates to bending the flat blank into a U-shape, and then withdrawing a folder to permit the placing of another flat blank upon the matrix.

The dies in the defendant's machine have substantially the same conformation upon their working forces as have the Sprague dies, and they operate upon the U-shaped blank in the same manner substantially and produce the same result.

The defendant's dies do not have anything which correspond to or are the equivalent of the recess n' or the wedge-shaped tongue n^2 shown in the Sprague patents; but I do not understand that the dies must have these features, the recess and tongue, or either of them, in order to come within the scope of that claim; nor do I understand that both dies must reciprocate in order to come within the terms of that claim, because such reciprocation of both dies is

not essential in order that they should properly shape the
48 lever; hence the dies in both machines operate substantially alike with the same result, and so far as that fourth claim is concerned one pair of dies is the equivalent of the other.

So, also, the mandrel in the defendant's machine is, so far as relates to the confirmation of that part of it against which the buckle lever is compressed, the same, and its function is the same so far as relates to its operating in combination with the dies in properly shaping the lever.

It is true the sides of the mandrel occupied horizontal planes instead of vertical planes as in the Sprague patent; but when the U-shaped blank was being pushed out of the matrix it occupied a horizontal position corresponding to that of the mandrel, having been oscillated upon its trunnions after the folder had been withdrawn in order to present the U-shaped blank in proper position for being transferred to the mandrel.

During this transfer the carrier passed through the throat of the

matrix the same as in the Sprague patented machine; and while I am not clear in my recollection as to whether this carrier which passed through the matrix was in one and the same piece with the carrier which moved the blank onto the matrix, I am unquestionably of the opinion that it was the full equivalent of the Sprague carrier in the combination covered by that fourth claim of that Sprague patent.

For these reasons I am of the opinion that that defendant's machine contained the combination of devices recited in the fourth claim of Sprague patent No. 228,136.

Adjourned to October 17th, 1881, 9 a. m.

N. Y., *October* 18, 1881.

Present: Counsel as before.

Testimony of H. H. DOUBLEDAY continued in chief.

Q. 11. Compare the mechanism of defendant's machine with the Sprague machine, referring specially to the combination of
49 parts specified in the fifth claim of letters patent 228,136, and if you find such combination in the defendant's machine give your reasons.

A. I find, upon making the desired comparison, that the defendant's machine did contain that combination, although not in the precise form in which it was embodied in the Sprague patent.

As I understand that fifth claim, the essence of the invention therein covered is the combination with the mandrel and the first pair of forming dies which act in conjunction with it, of springs interposed between the dies and the mechanism which advances them towards the mandrel and against the U-shaped blank, by a positive movement—that is to say, a movement which near its close is a positive one, the function of these springs being to insure that, even though the *that* positively acting mechanism would of itself permit the dies to be withdrawn to such a distance from the mandrel that the recoil of the legs of the partially formed lever from the mandrel would be such as to create a liability of the partially formed lever telescoping over the rear end of the completed lever, which is in front of it, (between the dies *O O*,) and which is advanced on the mandrel by the partially formed lever, as it—the partially formed lever—is being advanced from the dies N N′ to the dies O O.

The description of the construction and operation of these springs is found in lines 10 to 20 and lines 55 to 65, inclusive, page three, and lines 45 to 55, page four, of the Sprague patent 228,136.

It is obvious that such telescoping would be objectionable from the fact that at the point where it occurred, there would be two thicknesses of metal interposed between the die and the mandrel upon each side of the mandrel, instead of one thickness upon each side, as there is when the machine is operating properly.

It will be seen that such doubling up of the thickness of
50 brass between the dies and the mandrel would seriously and needlessly overstrain working parts of the machine.

Now, in that defendant's machine, while one of the dies was stationary, and there was no spring interposed between the movable die and its actuating mechanism, yet substantially the same result was obtained by so constructing the mandrel and its support that it, the mandrel, pressed one leg of the partially formed lever against the lower stationary die, thereby practically preventing the adjacent ends of the partially formed lever and completed lever from telescoping, as I understand the operation of that machine.

It was, of course, necessary that the mandrel and its support, one or both, should have sufficient elasticity to permit the mandrel to rise from the lower stationary die when the U-shaped blank was thrust upon the end of the mandrel, and to return toward the mandrel when forced down by the upper die (the tension of the mandrel not being sufficient of itself to bend the brass), and to press the lower leg of the partially formed lever against the movable lower stationary die after the upper movable die has been withdrawn.

I did not examine that machine with sufficient care to be able to state of my own knowledge that the mandrel and its support, one or both of them, was made elastic and operated in the manner I have described, but I so understood from the explanation which was given me when I saw it in operation in May or June, 1880, and I believe that my description given in this answer is correct. If my understanding of the matter is right then I am clearly of the opinion that such constructing the mandrel and support, one or both of them, that the mandrel shall act to press one leg of the partially completed lever against the stationary die to prevent a recoil of said leg from the mandrel, was the equivalent in that machine of the springs, which were interposed between the dies N and N′ and then actuating mechanism in the Sprague patent.

51 It seems to me that such a change was a merely formal one, involving no substantial difference in the mode of operation of the parts or of the results produced, and, as I have already expressed the opinion that the mandrel and the dies in the defendant's machine were the equivalents of the mandrel and the dies in the Sprague patented machine, and as I regard the transfer of the yielding or elastic feature (which prevented telescoping) from the dies to the mandrel as being a merely formal immaterial change, it seems to me that defendant's machine contained the invention recited in the fifth claim of the Sprague patent No. 228,136.

Q. 12. Compare the mechanism of defendant's machine with the Sprague machine, referring specially to the combination of parts specified in the first claim of letters patent No. 231,199, and if you find such combination in the defendant's machine give your reasons.

A. I think the defendant's machine did contain the invention which forms the subject-matter of that first claim, which, as I understand it, covers the combination of a support marked n^2 in the Sprague drawings with the mandrel and the dies which form the U-shaped blank into the completed lever, such support being placed at a short distance from the edge of the mandrel which has the rib

"m" upon it, and in proper position to engage with the closed end of the U-shaped blank.

Thus the support assists in presenting the U-shaped blank in proper position relative to the mandrel and the dies during the operation of bending the blank to fit the mandrel, and during such operation presses the lower portion of said blank which is formed into the part "u" of the lever against the rounded lower face of the rib "m," while the dies, particularly the grooved portions N N_x, are forming the seat of the central bar of the buckle frame. In that defendant's machine there was a rib arranged in substantially the same position relative to the mandrel as that occupied by the tongue n^2 in the Sprague patent when the dies are bending the metal.

Although in the Sprague patented machine the tongue n^2
52 is attached to and moved with the die, while in the defendant's machine the rib or bar was supported independently of the moving die, yet in both constructions the office of the support was substantially the same, so far as relates to the function which I have described, and which, as I understand it, is the only duty to be performed by the support when considered as one of the elements in the combination covered by that claim.

In the Sprague patent it is described in lines 45 and 50, page four, as follows:

"Referring to Fig. 6, it will be understood that the wedging tongue n^2 supports the lower end of the part u of the lever firmly while the dies N N′ are compressing the metal upon the mandrel; but owing to the wedge-shape of this tongue when the die N is withdrawn from the mandrel the blank is released from upward pressure against the mandrel, so that it can be readily fed forward to the dies O O."

In view, however, of the fact that, as I understand the matter, Sprague was the first to combine in machine to make buckle levers the elements which are embraced in that claim, I am of the opinion that the invention is not limited to a support which is attached to and travels with one of the dies, nor to a support which can yield or be withdrawn to facilitate sliding the partly formed lever on the mandrel. But, on the contrary, while the Sprague support is described as having these peculiarities, or some of them, yet they are merely incidents of construction, and it seems to me that it is not necessary that the support in the defendant's machine which corresponds to the tongue n^2 should be either yielding or movable in order to be the equivalent of that Sprague support in the combination covered by that first claim of patent 231,199. Neither would such support, in my opinion, fall short of being an equivalent of the Sprague support, even though it did yield slightly under pressure.

Q. 12½. Compare the mechanism of defendant's machine with
53 the Sprague machine, referring specially to the combination of parts specified in the second claim of letters patent 231,199, and if you find such combination in the defendant's machine give your reasons.

A. In my opinion the defendant's machine did contain the inven-

tion which forms the subject matter of that claim, which covers, as I understand it, the combination of three instrumentalities, to wit, a die which strikes out blanks from a thin sheet of metal as the first elements; secondly, two or more forming or bending or swaging dies, which, by their successive operations, convert the blank into a completed buckle lever; and, thirdly, a pusher or feeder which takes the blank from the punch and delivers it to the first of the series of bending dies, and also advances a partially formed lever to a position where it can be acted upon by the next pair of forming dies. In the Sprague drawings forming part of this patent 231,199 there are shown three pair of bending or forming dies, and there were in that defendant's machine three pair of similar dies arranged in the same relation to each other substantially, and by means of the succession of operations producing from a flat blank a completed buckle lever like that represented by the "Sprague Exhibit Completed Lever."

It does not seem to me to be necessary to describe in detail the construction and relative arrangement of the elements embraced in that second claim, because they are the same parts as are recited in the third claim of patent 228,136, except that in that third claim the mandrel entered as one of devices, while in this second claim under discussion the mandrel is omitted.

By reason of this omission this second claim is somewhat broader in its scope than the third claim of patent 228,136, including, as it does, only three elements instead of four.

But as there was nothing in that machine which took the place of the mandrel or performed its office it seems to me that it, the
54 said machine, contained the invention embraced in this second claim, as well as that which was recited in the third claim of the earlier patent.

Q. 13. Compare the mechanism of defendant's machine with the Sprague machine, referring specially to the combination of parts specified in the third claim of letters patent 231,119; and, if you find such combination in the defendant's machine, give your reasons.

A. That defendant's machine had in it the invention covered by this third claim, in my judgment, the parts which constituted that invention consisting of the same devices referred to in my answer to interrogatory 12, when describing the invention covered by the first claim of the same patent.

In that answer I endeavored to explain that the wedge-shaped tongue n^2, shown plainly in figure 6 of the second Sprague patent, entered into the combination there under discussion as a support to press the bit of the lever up under and against the rib m of the mandrel, to insure that the U-shaped blank should be held in suitable position while being bent against the mandrel; but in the Sprague patented machine the tongue n^2 performs an additional function, which is that of determining the length of the lever bit u.

This I understand to be quite important in the manufacture of this class of buckle levers, in order that when the lever is placed upon the buckle frame and mounted on the central bar of such

frame the space between the edge of the bit and the opposing end bar of the buckle frame shall be of such width that the lever shall gripe the straps firmly against such end bar, the relation of such parts—that is, the buckle from the buckle lever and the strap—being shown in figure 15 of the Sprague patent.

I understand that this result—that is, of making the lever bits u of uniform width between the grooves u^2 u^3 and the edge of the bit—
55 is accomplished by so constructing the tongue u^2 that its face, which is toward the rib m of the mandrel, shall maintain practically a uniform distance from the mandrel while the bit is being formed.

This is done in the Sprague machine by having the tongue rest upon the bed-plate of the machine, so that it cannot be forced away from the mandrel as the dies advance, thus insuring a practical uniformity in the width of the bit.

Thus the tongue formed not only a support to press the bit against the opposing portion of the mandrel, but it also constituted a stop to determine the width of the bit, and was, so far as it being possible to thrust it away from the mandrel, a fixed stop.

Now, in that defendant's machine, as I understood it, the rib or bar, to which I referred in answer to interrogatory 12, was capable of being fixed in position relative to the adjacent portion of the mandrel, and was fixed when the machine was in operation in order that it might serve the same purpose as a stop to determine the width of the lever bit in substantially the same manner as does the tongue u^2 in the Sprague patented machine, and I understand that it did produce the same result in making all the lever bits of uniform length.

I do not mean by this that either the Sprague machine or the defendant's machine made the bits of the levers of uniform width irrespective of the size of the lever, because I understand both machines, with slight alteration, such as the substitution of certain sizes of punches, dies, and mandrels for certain other sized corresponding parts, were capable of making buckles of different sizes, all being substantially of the same pattern; but I mean that when punches, dies, and mandrels of a certain size were used, and the stop was set at a proper point relative thereto, all the buckle levers which were produced by the machine while in that condition would have their bits of uniform width.

Hence, I find that while there were some differences in the construction and arrangement between the Sprague stop and that
56 in the defendant's machine, such variations were purely formal and immaterial, and did not result in any change in the mode of operation or in the result produced by the combination in which that stop was employed, and that hence the defendant's machine contains the invention covered by the said 3d clain of Sprague patent No. 231,199.

Q. 14. Compare the mechanism of defendant's machine with the Sprague machine, referring specially to the combination of parts specified in the fourth claim of letters patent 231,119; and, if you

find such combination in the defendant's machine, give your reasons.

A. I find upon examining this fourth claim that, as I understood the machine at that time, it did contain that invention, which consists in adding to the elements embraced in the third claim just discussed a second stop, arranged to receive the end of one leg of the U-shaped blank as it is being thrust upon the mandrel and between the first pair of dies to insure that it, the U-shaped blank, shall be in proper position relative to the mandrel and the first pair of dies when said dies advance upon the blank.

It will be readily understood, upon an examination of the drawing of the Sprague patent, particularly figures 2, 6, and 13, and the description embraced in lines 85 to 110, page 3, that as the U-shaped blank is being formed in the matrix L one leg, the one nearest the front of the machine (that side of the machine which is seen in figure 13), will snap under the rib m^3, whereby the U-shaped blank is prevented from being withdrawn from the matrix; and it will also be seen that when this blank is being pushed out from the matrix and onto the end of the mandrel between the dies N N′ its bent closed end rests against the tongue n^2, while the upper end of one leg rests against the under face of the rib n^3 on the mandrel, and slides in contact therewith, so that by reason of these guides the blank will be prevented from moving vertically relative to the mandrel, although free to move lengthwise on the mandrel.

57 As I understood the construction of the defendant's machine, it had, in addition to the mandrel like the Sprague mandrel, and the bending and swaging dies, which corresponded to the Sprague dies N N′, and the stop, a short distance from the rib, on the edge of the mandrel, as I have described, an additional stop arranged to engage with the end of one leg of the U-shaped blank when the blank is being thrust from the matrix upon the end of [the] mandrel. These two guides, serving to prevent the blank from being moved sidewise relative to the mandrel in substantially the same manner as the tongue n^2 and the rib m^3 in the Sprague patent, prevent the U-shaped blank from moving vertically relative to the mandrel, it being understood, of course, that in the Sprague machine the mandrel stands up edgewise, while in the defendant's machine the mandrel lies down flat.

Thus the defendant's machine contained all the elements in that fourth claim, and under the same combination and relative arrangement.

Q. 15. Compare the mechanism of defendant's machine with the Sprague machine, referring specially to the combination of parts specified in the fifth claim of letters patent 231,119; and, if you find such combination in the defendant's machine, give such reasons.

A. I think that the defendant's machine, when I saw it in operation making buckle levers, was making them in exact accordance with that part of the Sprague invention which is recited in that fifth claim of patent 231,199, because in produring such buckles it did so by means of a sequence or succession of operations corresponding exactly to the series of progressive steps which is enumerated in that

fifth claim; and not only was the number of steps the same, and the character of the manipulations the same, but they took place in the same order as that which is described in the Sprague patent and referred to in that fifth claim.

Adjourned to October 31st, 1881, 9 a. m., by consent.

58 NEW YORK CITY, *October* 31*st*, 1881.

Taking of testimony adjourned by consent to November 2*d*, 1881.

NEW YORK CITY, *November* 2*d*, 1881.

Further adjournment had, owing to engagement of counsel, by consent, to November 3d, 1881, 12 o'clock noon.

NEW YORK, *November* 3*d*, 1881.

Present: Counsel as before.

Examination of witness DOUBLEDAY continued in chief:

Q. 16. Have you, since you previously testified, seen and examined the machine now in use at The Smith and Griggs Manufacturing Company's factory at Waterbury, Conn.; if yea, when and how thoroughly did you examine it?

A. I have examined that machine for making buckle levers. In October 19th, 1881, I went to Waterbury for that purpose, and examined the machine carefully, both as to structure and mode of operation, while it was being used in my presence for making buckle levers.

Q. 17. For what purpose did you make the examination?

A. For the purpose of having made under my direction drawings which would illustrate its structure and operation.

Q. 18. State whether the machine has been altered at all since you saw it, before your former testimony in this cause.

A. Yes; there had been some slight changes in details of construction.

Q. 19. In preparing your drawings, was your object to show the operative parts of the machine as they now are simply, or was it to show the operative parts of the machine in both the unaltered and altered form?

A. I desired to show the machine in both forms—that is, as it was when I first examined it in 1880, and as it was when I examined it the last time.

Q. 20. Please produce the drawings prepared under your
59 directions after the second examination of that machine, and explain the same.

A. I have in my hand a sheet containing four figures, figure 1 being a partial vertical section of the Sprague machine, showing the die C^2 and plate D which punches the blank from the ribbon, the matrix L and folder l^2, the mandrel M, and one of each pair of dies N′ and O.

In this drawing figure 1^a is a similar section of that Smith and Griggs machine.

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Fig. 1

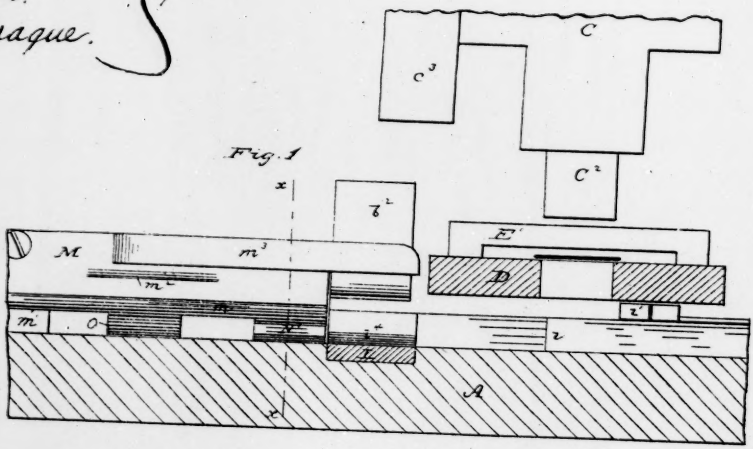


Fig. 2

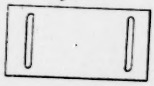
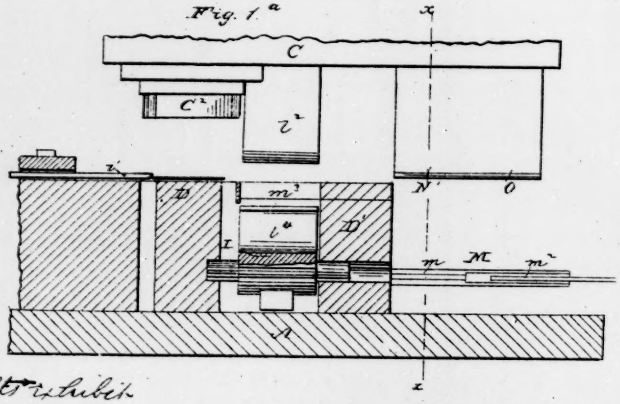


Fig. 1ª



Complete exhibit
Double day drawing
Not Glenbloak
machine
J. F. H.
N. P. etc
Nov 3/81

Fig. 2ª

There are slight differences in detail and also of operation between the two machines.

For instance, in the Sprague machine the die or punch C^2 strikes out the blank by punching it through the opening in the plate D; whereas in the Smith and Grigg machine the die C^2 serves the ribbon, cutting off therefrom a series of blanks one at a time; other dies behind the die C^2 punch slots in the blank near its ends, the position of these dies being shown in dotted lines.

There are similar punches in the Sprague patented machine marked *c*.

These punches and dies in both machines are attached to a reciprocating die "stock" or head C, at each reciprocation of which there is formed a flat blank shown on this drawing, the Sprague blank being marked figure 2, the Smith and Griggs blank being marked figure 2^a. The letters of reference upon these figures, and, in fact, upon all the drawings which I have had prepared, are those which are used in the Sprague patents to designate corresponding parts; and in order to facilitate a comparison of the defendant's machine with the Sprague patents, I have used the same letters to designate parts which appear to me to be the equivalents of those which are referred to in the claims of the Sprague patents.

Another immaterial difference between the defendant's machine and the Sprague machine, as illustrated in the drawing,
61 is this: in the Sprague machine the flat blank, as it undergoes the successive operations of bending and swaging, moves from right to left, while in the defendant's machine the blank moves from left to right.

I desire to add that unless the machine has been altered since I first saw it, my answer to question 7 should be modified to this extent: that instead of the blank (the flat blank) being pushed through the bed-plate over which the ribbon is fed, the blank remains upon the bed-plate while the piece which is cut out of the ribbon between the blanks is pushed through a slot in the bed-plate, the slots in the flat blank near its ends being punched by the same stroke of the die "stock" which cuts off the blanks, instead of being punched by a prior stroke, as in the Sprague patented machine.

I make this correction, not because such difference in defendant's machine would involve any change in the result produced, or in the question of its embodying any one of the inventions recited in the various Sprague claims to which my attention has been directed, but for the sake of greater accuracy of statement.

I have not shown the mechanism, in either the Sprague machine or the defendant's machine, which imparts to the dies or punches their reciprocating motions, such devices being substantially of the construction usually employed for that purpose in machines of similar character.

(Complainant offers in evidence the drawing referred to by the witness, and requests the notary to mark the same "Doubleday Drawing No. 1 (flat blank mechanism)", which is done accordingly. J. H. H., notary public, etc.)

(Here follows drawing marked page 60.)

Witness, resuming, testifies:

62 The drawing which I now have in my hand represents the mechanism employed in the Sprague patented machine and in the defendant's machine for bending the flat blank into the U-shaped blank.

Figure 3 represents the matrix L, the folder l^2, and a stop m^3 of the Sprague patented machine, the stop being an extension of the rib m^3, which projects from the upper part of the mandrel M (see figure 1), and is arranged in close proximity to the side of the folder, so that when the folder pushes the flat blank down to the matrix one leg of the U-shaped blank thus formed is thrust under the stop as indicated in dotted lines figure 2, whereby the U-shaped blank is prevented from being drawn out of the matrix by the folder in its upward movement.

In figure 3^a the matrix L is constructed (in defendant's machine) with inwardly-projecting ribs m^3, which serve as stops to retain the U-shaped blank within the matrix after the folder l^2 has been withdrawn.

In defendant's machine the matrix is oscillated upon its trunnions, carrying with it the U-shaped blank, which operation made it desirable to provide a support, L′, upon which the flat blank might rest while the matrix was thus being oscillated, the upper face of this support being on a line with the upper face of the bed-plate over which the ribbon was fed and over which the flat blank is moved by the carrier i'. (See figure 1^a.)

As I have previously described in folios 7, 8, and 18 to 21 of my testimony the construction and operation of the devices by which the U-shaped blanks are formed in these two machines, I do not think it will be necessary to refer to them any further in detail.

(Complainant offers in evidence the drawing last referred [to] by the witness and requests the notary to mark the same "Doubleday drawing No. 2 (U-shaped blank mechanism)," which is accordingly done. J. H. H., notary public, etc.)

(Here follows drawing marked page 62.)

Witness, resuming, testifies:

64 The next step in both the Sprague patented machine and the defendant's machine is the bending of the U-shaped blank into a partially completed lever, and for the purpose of facilitating a comparison between the mechanism in the two machines I have made three figures representing corresponding parts of each machine.

Figures 4 and 4^a are side views of the matrix, and end views of the mandrels, showing their relative position when the U-shaped blank is being pushed from the matrix and upon the end of the mandrel.

In the defendant's machine the matrix (figure 4^a) has been oscillated from the vertical position shown in dotted lines to a horizontal position (full lines), so that its throat is opposite the end of the

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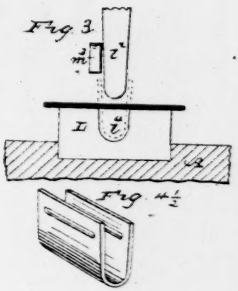

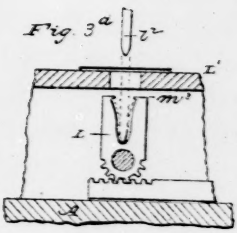

Complt 2d Exhibit "Drawings" diagrams No 2 (Wedge-
-d blank mechanism) J. F. H. N. 2 &c
Nov 3/81.

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Sprague
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Fig 4

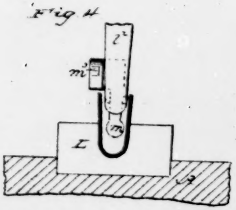

Fig. 5

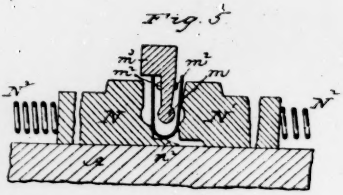

Fig. 6.

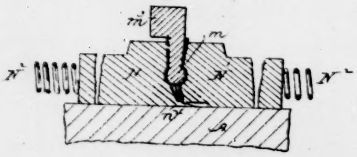

Fig 7

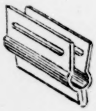

Fig 4a

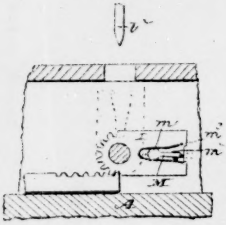

Fig. 5a

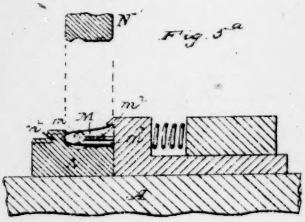

Fig 6a

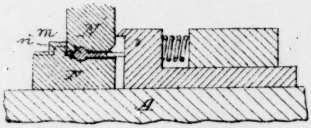

Fig. 7a

Complete Exhibit Drawing
No 3 (Case) from Patent Examination
November 31 81 — J H H NP

mandrel M, which lies flatwise to receive the U-shaped blank. A pusher, reciprocating on a line substantially parallel with the ribs m m^2 of the mandrel entering the throat of the matrix upon that side which is seen in figure 4ª, pushed the U-shaped blank out of the matrix endwise in substantially the same manner as the projecting end i of the Sprague carrier pushes a U-shaped blank out of the matrix onto the Sprague mandrel; this pusher and the one which pushed the flat blank onto the matrix, although actuated by different cams, were so timed as to act substantially at the same time.

While in the Sprague machine such blank is pushed from the matrix directly onto the mandrel, in the defendant's machine the U-shaped blank, after leaving the matrix, passes through a wall or plate, D′ (figure 1ª), before reaching the mandrel. This interposed wall was apparently put into the machine to support one of the trunnions of the matrix, and has a slot cut in it of substantially the same form in cross-section as is the throat in the matrix below the ribs m^3, so that the walls of such slot form practically a continuation of that part of the throat of the matrix below the ribs m^3, and serve to guide the U-shaped blank, as it is being thrust from the matrix by the pusher, and insure its delivery upon the end of the mandrel, the blank which is being pushed out of the matrix and into the slot pushing the preceding blank out of the slot and onto the end of the mandrel.

The U-shaped blank, when on the end of the mandrel, was located between two dies, N N′, as in figure 5ª, occupying substantially the same position relative to the dies and mandrel as does the U-shaped blank in the Sprague machine, these figures, 5 and 5ª, being transverse sections taken on lines x x, figures 1, 1ª.

The die N′ was then brought down upon the blank and mandrel into the position shown in figure 6ª, bending the U-shaped blank around the rib m of the mandrel, and forming also a bit at the closed end of the lever, making a partly formed lever, Fig. 7ª, the same as is done by the Sprague dies and mandrel. See Figs. 6 and 7.

In figures 4ª, 5ª the smaller ribs m^2 are shown in elevation at the further end of the mandrel. See also Fig. 1ª.

In figure 6ª the ribs m^2 are hidden by the lever and dies.

(Complainant offers in evidence the drawing referred to by witness, and requests the notary to mark the same "Complainant's Exhibit Doubleday Drawing No. 3 (partly formed lever mechanism)," which is accordingly done. J. H. H., N. P.)

(Here follows drawing marked page 66.)

Witness, resuming, testifies: In figure 8ª of the drawing, which I now have, O O are the dies which complete the lever by bending the outer ends of its legs around the ribs m^2 of the mandrel, the partly formed lever having been advanced on the mandrel to a point between the dies by being pushed forward by a U-shaped blank, which was thrust between dies N N′, which in turn had been pushed out of the slot in the wall D′ by another U-shaped blank, which had

been pushed out of the matrix L by the end *i* of the carrier
68 I, shown in figure 10^a, in substantially the same manner as the U-shaped blanks and the partially formed levers are advanced in the Sprague machine, a partial view of which is shown in figures 8 and 10.

Figures 8 and 8^a being transverse sections taken on lines *y y* of Figs. 10, 10^a respectively.

In both the defendant's machine and the Sprague machine the ribs *m* at the edge of the mandrel were clasped by the grooves in the legs of the levers; therefore, the said ribs were adapted to serve as guides to direct the partly formed levers to proper positions between the dies O O, where they receive the final action of the dies and the ribs m^2, which form the grooves in the ends of the completed levers, as shown in figures 9, 9^a.

In figure 8^a, N^2 O′ is a spiral spring interposed between a bedplate and an arm of the mandrel support to hold the mandrel in close contract with the lower stationary die, and to press the mandrel and blanks downward toward or upon the lower die, to prevent the blanks and partly formed levers from telescoping when being thrust along on the mandrel, as I explained in folios 65 to 70, inclusive, of my previous testimony in this cause, the mandrel support being pivoted at m^4, figure 8^a.

This single spring, N^2 O′, acting to press the mandrel down throughout its whole length upon the dies N O, takes the place of the four springs N^2 O′ in the Sprague machine, as shown in figure 10 of this drawing.

(Complainant offers in evidence drawing referred to by witness, and requests the notary to mark it "Complainant's Exhibit Doubleday Drawing No. 4 (completed lever mechanism)," which is accordingly done. J. H. H., N. P.)

(Here follows drawing marked page 67.)

Witness, resuming, testifies:

Referring to figure 5^a on "Doubleday Drawing No. 3," m^3 is a rib projecting upwardly from the die N, with which the end of
69 the lower leg of the U-shaped blank engaged, there being a corresponding rib, n^2, at the opposite side of the die N, with which the closed end of the said blank engaged as it was being thrust onto the end of the mandrel and between the dies, these ribs being adapted to act as stops or guides to insure that the U-shaped blank shall be properly placed relative to the dies and mandrel, as do the ribs m^3 on the Sprague mandrel and the tongue n^2 of the Sprague die N, as shown in figure 5, "Doubleday Drawing No. 3."

So also the rib n^2 of the defendant's machine, figure 5^a, same exhibit drawing, operated in substantially the same manner as does the tongue n^2 in the Sprague patented machine, so far as relates to pressing the lower portion of the blank against the rib *m* of the mandrel, while the dies are forming the seat grooves, and also is adapted to operate in the same manner as does the same tongue, so far as relates to its functions of determining the length of the bit of the lever.

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Fig. 8.

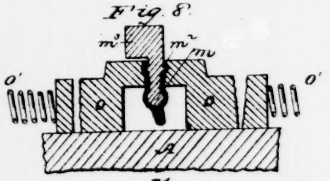


Fig. 9.

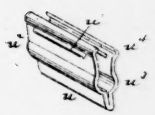


Fig. 10.

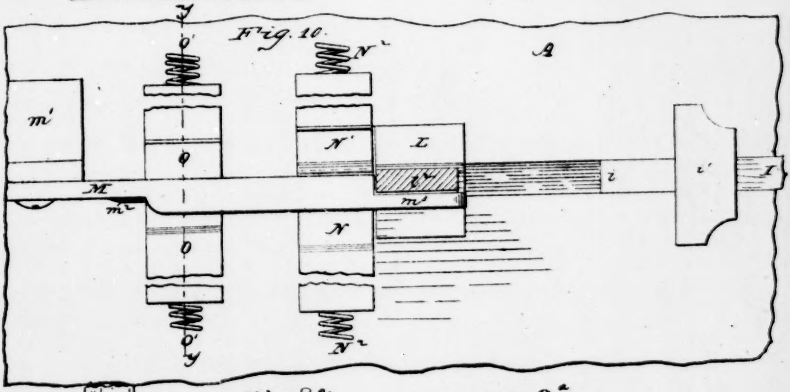


Fig. 8a

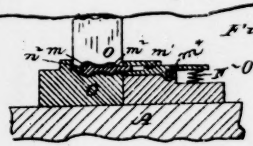


Fig. 9a

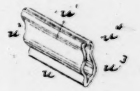
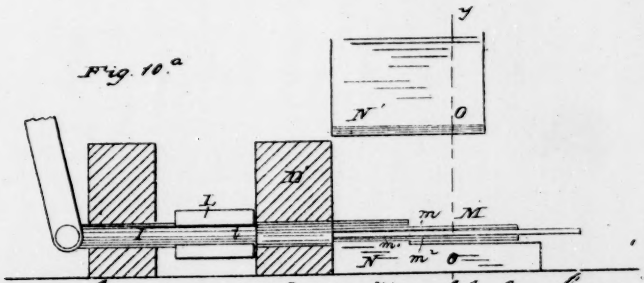


Fig. 10a.



Complet exhibit Deuble day drawing
No 4. Complet. Solenoid mechanism
Dec 3/91. J. H. H. N. P.

It does not seem necessary for me to describe the uses of these ribs any more fully than I have done in my answers to questions 12 and 13, folios 71 to 75, inclusive, and 80 to 86, inclusive, of my former testimony in this cause.

Adjourned, by consent, to November 4th, 1881.

NEW YORK, *November 4th*, 1881.

Present: Parties as before.

Testimony of H. H. DOUBLEDAY, a witness on behalf of complainant, continued in chief:

Q. 21. In your judgment do the alterations made in defendant's machine since you first saw it prevent its embodying the inventions patented to Sprague in the two patents in suit?

A. No; they do not "prevent" its embodying most of those inventions.

Q. 22. Give your reasons for the last answer; and, if your testimony as to the original machine of defendant's needs any
70 modifications in order to make it applicable to the altered machine, please give such.

A. In examining that, defendant's, machine the last time, on October 19, 1881, I discovered that they had made a change in the dies which first act upon the U-shaped blank after it has been placed upon the mandrel.

As shown in "Doubleday Drawing No. 3," the dies N N′ have each one groove adapted to press the metal around or upon the rib *m* of the mandrel, thus forming in each leg of the partially formed lever one-half of the seat which receives the central bar of the buckle frame; that portion of each die which engaged with the partly formed lever between its seat grooves and its open end being substantially flat and smooth, thus necessitating the employment of a second pair of dies, marked O O figures 8^a, 10^a, "Doubleday Drawing No. 4," to form the small grooves near the ends of the legs of the completed buckle lever, figure 9^a, last aforenamed exhibit drawing.

In the machine as I last saw it, the first pair of dies N N′ had not only the grooves adapted to form the seat grooves u^2 u^3, but also the grooves or recesses adapted to form the end grooves u^4, the second pair of dies having been dispensed with.

I did not observe any other alterations. The result of this modification in the defendant's machine is that the U-shaped blank is bent or swaged into a completed lever at a single impression of the dies, instead of requiring two impressions by two sets of dies, as is the case in the Sprague patented machine, and as was the case with the defendant's machine before the change in the form of the dies N N′.

I do not discover any necessity for modifying the opinion which I have heretofore expressed as to the defendant's machine embodying the inventions embraced in the 1st, 3d, 4th, and 5th
71 claims of the Sprague letters patent No. 228,136, and of the inventions recited in the 1st, 2d, 3d, and 4th claims in the

Sprague letters patent 231,199, as the machine was constructed when I first saw it in May or June, 1880, and it seems to me that that machine as modified contains all of these inventions except that which forms the subject, matter of the 1st claim of Sprague patent No. 228,136.

As I understand such first claim, the invention therein covered includes two pairs of dies, with an interposed mandrel having not only the small rib *m*, around which the blank is bent to form the seat grooves, and two ribs m^2, around which the metal is bent to form grooves near the end of its legs, but it is also essential that the two pairs of dies shall be so placed as to act upon the metal while the blank is in different positions on the mandrel, and that the mandrel shall have upon it a rib adapted to serve as a guide for the partly formed lever while it is being moved from one pair of dies to the other pair.

Now, while in the defendant's machine, as modified, the mandrel has the rib *m* on one edge, and the seat grooves of the buckle slide along on that rib after they have been formed by the dies N N′, yet that rib does not serve as a guide to insure that the partly formed lever shall be placed in proper position to receive the impress of a second and separate pair of dies as it does in the Sprague patented machine, and did in the defendant's machine before it was modified.

(Complainant offers in evidence "Doubleday Drawing No. 5 (illustrating alterations)," and requests the notary to mark the same "Complainant's Exhibit Doubleday Drawing No. 5 (illustrating alterations)", J. H. H., N. P., Nov. 4, '81, which is done accordingly.)

(Here follows drawing marked page 72.)

Witness, resuming, testifies:

It is true that in the 1st claim of the Sprague patent 231,199, the two pairs of dies, N N′, O O, are enumerated specifically in combination with the mandrel and a support which holds the
73 bit of the lever firmly against the mandrel, but I do not understand that there is anything in the body of the specification of that Sprague patent 231,199 which in any manner limits that claim to the combination with its other elements of dies which operate successively upon the blank in such manner that one pair of dies shall bend a U-shaped blank into a partially formed lever, having the bit *u*, the seat grooves, and the legs which are flat from the seat grooves to their ends, and then by means of dies which are provided with groves *o* and which act to press the metal against the mandrel after the lever has been moved about its length upon the mandrel, and, in conjunction with ribs on the mandrel, produce small grooves near the ends of the legs.

It seems to me that the question whether the dies which form the grooves u^4 operate upon the metal, while it, the metal, remains in the position in which it is first placed on the mandrel, or after the partly formed lever has been moved about its length further along on the mandrel, is a wholly immaterial one so far as relates to the

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Fig. 5ᵇ

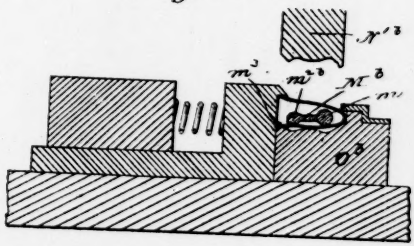


Fig. 6ᵇ

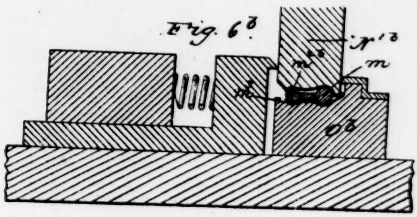


Fig. 8ᵇ

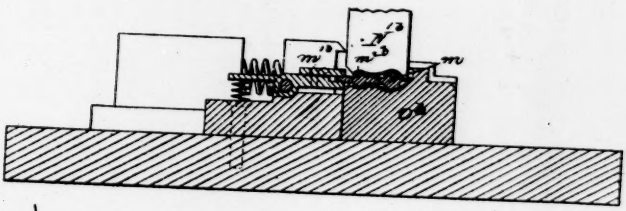
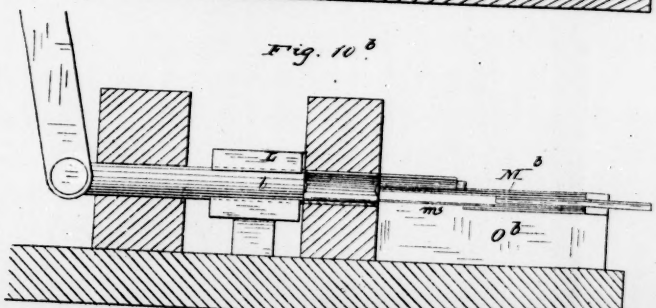


Fig. 10ᵇ



Complete Exhibit "Dimbleday drawing No 5 Illustrating alleged invention"
Nov 4/81 J. H. H. N. P.

invention covered by that first claim, and that therefore the defendant's machine contained that invention both before and after its modification.

It also seems to me that when making buckle levers upon that modified machine the defendants were using the invention recited in the 5th claim of the Sprague patent 231,199, from the fact that the metal from which the lever was formed was manipulated in the same manner as it was before the machine was modified with one slight, and it seems to me immaterial, exception, the operation producing a buckle which appears to be identical with the buckle produced by the machine before it was modified.

The only difference between the operations of the two machines—the original and the modified—so far as I am aware, is that in the original and the Sprague machine in carrying out that method the seat grooves are completed before the end grooves u^4 are com-
74 menced, while in the modified machine the seat grooves u^2 u^3 are only partially completed before the end grooves u^4 are commenced.

But I do not understand that such change in the operation is anything but a modification, a merely formal or colorable change.

For instance, it might be very inconvenient to form the end grooves u^4 in the flat blank before it is bent into U-shape, or in the U-shaped blank before it is bent into the partially completed lever, or before it is placed upon the mandrel; and I can readily understand that it would be very undesirable to form the end grooves after the U-shaped blank was placed on the mandrel previously to forming the bit and the deep-seat grooves, because of the difficulty that would attend the forming of these seat grooves after the ends of the lever had been griped upon the mandrel, and were thereby held firmly in a fixed position.

But, owing to the fact that the end grooves are very shallow, and, therefore, effect but little or no change in the length of the blank during their formation, I can readily understand why it is better to defer making them until after the formation of the bit and the deep-seat grooves are completed, as was done in the Sprague patented machine and in the defendant's machine before its modifications, and is practically done in the defendant's modified machine.

I understand the essence of that method claims to be commencing the formation of the end grooves subsequently to the formation of the bit and the seat grooves as opposed to commencing forming the end grooves previously or simultaneously therewith, and I think, in working the defendant's modified machine, the end grooves u^4 are formed substantially subsequently to the formation of the bit and seat grooves, and after any change in the length of the blank or the position of any of the metal in the blank relative to its length has been effected, so that the further action of the dies after they have commenced pressing the metal against and around the
75 ribs u^2 of the mandrel will not stretch or swage the metal to any objectionable extent.

Adjourned to November 10th, A. D. 1881, at 10 o'clock a. m.

Adjourned, by consent, to November 21st, 1881, at 1 o'clock p. m.

And now, Monday, November 21st, 1881, examination of H. H. DOUBLEDAY resumed, parties present as before.

Cross-examination of H. H. DOUBLEDAY by GEORGE E. TERRY

(Counsel for defendant not being personally present at the last examination, although taken with his consent, desires at this time to note an objection to so much of the testimony as relates to the machine now in use by the defendant, or any changes or modifications of any machine of the defendant made since the filing of the bill of complaint in this case. Not, however, waiving such objection, he will proceed to cross-examine the witness upon the same.)

C. Q. 23. In the machine of the defendant last seen and described by you, please state where you found the combination or its equivalent, to wit: "The combination with the mandrel, the punch which punches blanks from a continuous sheet of metal, and two or more dies which successively form the metal into the desired shape, of a carrier which moves a blank from the punches to the forming dies, and advances the partly formed levers against the preceding levers," as claimed in the third claim of Sprague's patent No. 228,136.

A. I find those elements which form the subject-matter of the third claim represented by, 1st, the punching die, the position of which is indicated in dotted lines in figure 1^a on Complain-
76 ant's Exhibit Doubleday Drawing No. 1—I mean the dotted lines on the punch, marked C^2 on Fig. 1^a on that drawing, and the punch marked C^2 in full lines on that drawing, these punches serving to form from ribbon of metal a flat blank, shown in Fig. 2^a of that drawing.

These punches serve the same purpose as do the punches marked C^2 *c c* in that Sprague patent 228,136, which form a flat blank, shown at Fig. 2 on that Doubleday drawing.

The mandrel, one of the elements in that combination, is marked M in that same exhibit, and has upon it—in the modified machine ribs marked *m* 2^b on Doubleday drawing No. 5, which mandrel corresponds to the mandrel in the Sprague patented machine, and thus constitutes the second element in the combination.

There was in that machine, as modified, two swaging or bending dies, the first of which is marked l^2, Doubleday Drawings Nos. 1 and 2, figures 1^a, 3^a, which, in connection with a matrix marked L, same figures, performed the first step in bending the flat blank into a buckle lever. This folder and matrix in the defendant's machine correspond to the folder and matrix L l^2 in the Sprague patented machine. The defendant's machine, as modified, contained a pair of dies which, acting conjointly with the mandrel, bent or swaged the U-shaped blank into a completed lever in substantially the same manner as do the dies N N′, O O of the Sprague patented machine. The completing dies in the defendant's machine, as modified, are marked N'^b and O^b Doubleday Drawing 5.

The folder, the matrix, and these completing dies are the equivalents, in my opinion, of the folder, the dies N N′, O O of the

Sprague patented machine, and constitute the third element in the claim under discussion, as I understand it.

The fourth element of the claim consists of the two carriers or pushers, marked *i*, Fig. 1ª and *i*, Fig. 1ᵇ, of the Doubleday Drawings
1 and 5, respectively, there being no change or difference, so
77 far as the structure or operation of the carriers is concerned,
between the defendant's original machine and its modified machine that I am aware of.

In both machines that part of the pusher *i* when thrusting a U-shaped blank out of the matrix advanced another and preceding blank which had been partly bent into shape, the end of one partly formed lever engaging with the preceding one and pushing it onto the mandrel in substantially the same manner as is done in the Sprague patented machine when the U-shaped partly formed lever which is being pushed out of the matrix engages with the preceding one, which is on the mandrel, and pushes it forward.

C. Q. 24. Do you not understand the words "two or more dies which successively form the metal into the desired shape" in said third claim as referring to the dies N N, O O, described in the specification of Sprague patent and claimed in the first claim thereof?

A. No; I do not.

The language of that third claim, as I understand it, intends to include within the scope of the words quoted in the question all of the dies which in the Sprague machine "successively form the metal into the desired shape," and thereby include the first of the series, which are designated as the folder and matrix, these being the ones which perform the first folding or bending after the flat blank has been formed from the ribbon by the punches C^2 *c c*.

I think a fair interpretation of the words "two or more dies" will include the matrix and its folder as one pair, and then the succeeding pair or pairs, if there be more than one succeeding pair used to complete the bending of the lever into the desired shape.

I can see no reason for thinking that the first pair of the series are outside the scope of that claim. If the words "or more" had
been omitted there might be some doubt as to whether the
78 final pair of dies O O in the Sprague patent were included
in that claim, but even had those words been left out I can see no reason for admitting the folder and matrix from the combination which forms the subject-matter of that third claim.

C. Q. 25. Does Sprague anywhere in the specification of his said letters patent describe or mention the folder l^2 and the matrix l^4, as shown in figure 6 of the drawing in said patent, or mention the same as a pair of dies for the formation of the completed lever from the flat blank?

A. Yes; in the specification he describes lines 95 to 115, second column, page 3. He describes the first bending operation, by which the flat blank is converted into a buckle lever, is performed by that folder and matrix.

He don't call them dies; he calls them by the specific terms folder and matrix; but I do not understand that the use of those specific descriptive terms removes them from the generic class of dies, or

prevents them from being included under the generic words—dies—two or more dies—in that third claim.

C. Q. 26. If Sprague had understood and intended the folder and matrix before referred to as one of the series of "two or more dies" referred to in said third claim, would he, in your judgment, been likely to have claimed in the fourth claim of said patent the combination "with the matrix L and folder l^2 of the dies M M′ the mandrel arranged to receive the blank from the matrix and the carrier?"

A. I can see nothing in the wording of that fourth claim which is anywise inconsistent with my understanding, that Sprague intended to include the folder and matrix in the third claim.

The fourth claim relates to a particular combination and arrangement of specific parts, while in the third claim the mechanism, except the mandrel which co-operates to transform a flat blank into a completed lever, is grouped together under the generic term of dies.

79 I am further confirmed in this belief by the fact that, if Sprague had intended to omit the folder and matrix from that third claim, he would be placed in the position of skipping over the folder and matrix, thus leaving them entirely out of the combination.

I don't believe that Sprague intended to claim the punch in combination with dies N N′, thus ignoring entirely the existence of the folder and matrix, which are interposed between the punch and the dies N N′, and perform an independent operation, one which is indispensable, in order that the dies N N′, with the mandrel, may perform their function.

I don't believe he intended to claim the first and third steps or set of devices, ignoring the existence of the second set which performed the first operation of bending the metal.

C. Q. 27. Do you, then, construe the third claim of said patent as claiming the combination of all the several parts of the patented machine necessary for forming the completed lever from a continuous sheet of metal, and that all the other claims in said patent are modified claims, or claims for a combination of some of the particular portions of the machine therein specified?

A. No, I do not, as I understand that question.

C. Q. 28. In the defendant's machine, as last seen and described by you, what, if anything, do you find that answers to or is equivalent for the springs N^2 N^2, as claimed in the fifth claim of said patent?

A. I find a spiral spring marked N^2 O′, Fig. 8^a, Doubleday Drawing No. 4, and shown in Fig. 8^b, but not lettered in Doubleday Drawing No. 5.

That spring was arranged to press upwardly an arm which projected over the spring, the arm being attached to a vibrating plate or clamp, which was pivoted near one edge to the bed-plate or frame-work of the machine at m^4, Fig. 8^a, Doubleday Drawing No. 4.

80 The mandrel was attached to the opposite edge of this plate, which occupied a horizontal position—as shown in same figure—so that when the spring pushed upward against the arm or heel extension of the pivoted plate it acted to thrust the mandrel downward toward the stationary die, thus pressing the interposed buckle lever down upon the bed-plate, these parts being adapted to prevent the levers partly formed (and completed) from telescoping, as each of them pushed the preceding one forward when thrust along by the pusher or carrier *i*.

C. Q. 29. Did the spring you have thus described in fact perform any such function, to wit, by means thereof press the mandrel upon the stationary die, and thus prevent the blanks from telescoping, but was not that function performed by means of the movable catch marked *m* 1ᵇ, shown in Fig. 8 1ᵇ of Doubleday drawing No. 5?

A. I think the spring N² O′ did press the mandrel toward the die with such force as to prevent the blanks or levers from telescoping, irrespective of the action of the sliding catch *m* 1ᵇ, and, in fact, I think there would have been no certainty of the blanks being pushed out of the mandrel without telescoping had it not been for the spring N² O′, whereas the presence of that spring, acting as it did, would insure, under ordinary circumstances, that there should be no telescoping, even though the spring catch had been dispensed with, although I have no doubt the spring catch was an additional safeguard.

C. Q. 30. If the drawing, Fig. 5ᵇ, as shown in Doubleday Drawing No. 5, is a correct illustration of the dies and movable catch in the defendant's machine, showing a stationary catch or projection, which engages the bit of the partly formed lever and also engages the heel of the same, how would it be possible for a blank, when thrust from the matrix through the slotted opening between it and the dies, to telescope with the blank already between the dies and held both by the bit and heel, as shown in said drawing?

81 A. By an examination of Fig. 2ᵃ, Doubleday Drawing No. 1, it will be seen that the flat blank made by defendant's machine has circular notches cut in its opposite sides about midway between its ends, so that when the blank is doubled upon itself it is shorter or narrower on a central line across its doubled end than it is on parallel lines at its opened end; so that when the U-shaped blanks are being pushed through the slot in the wall between the matrix and the mandrel, and also along on the mandrel, the closed or bit ends are not in contact with each other, but have V-shaped spaces between them.

Thus even though the U-shaped blanks be prevented from moving on a line at right angles to the mandrel, by reason of contact with the rib m^3, the vertical wall of the catch and the rib or projection at the opposite side of the lower die, the blanks could telescope, because the legs of the blank which is being pushed out of the slot in the wall D′ would be liable to telescope over the adjacent end of the completed lever on the mandrel; so also the U-shaped blanks might, I think, be liable to telescope each other in passing from the matrix into the slot in the wall D′.

Again, after the lever has been swaged or bent into completed form, its legs will recoil a little from the mandrel when the upper die is withdrawn; so that, even though the rib or stop n^2 be extended beyond the dies and on a line parallel with the rib m of the mandrel, I think there would be a liability of the levers telescoping by reason of the tapering form of the bits and shortness of their griping edges, were it not for the spring N² O′ forcing the mandrel downward toward the die. This description has reference to the defendant's machine as modified.

Of course, before it was modified, the spring catch could not hold the partly formed lever down upon the die, because the upper leg of the lever would not stick up high enough to engage with the horizontal lip of the spring catch after the first die has acted upon
82 it; hence, there would be a liability of telescoping were it not for the mandrel being pressed downward by the spring N² O′.

Adjourned to Tuesday, November 22d, 1881, at 9½ o'clock a. m.

And now, at 9½ a. m., of Tuesday, November 22d, 1881, examination of H. H. DOUBLEDAY resumed, parties present as before.

Witness continuing:

In making this answer I do not wish to be understood as saying that the parts would necessarily telescope, because I can readily understand that if the brass be sufficiently thick such telescoping might not occur, from the fact that the outside dimensions of the partly-formed lever or U-shaped blank being determined by the size of the opening or seat in the matrix, the inside dimensions of the blank would be determined by the thickness of the metal, and might be such as would, when taken in connection with the fact of the mandrel fitting closely to the inside blank and the increased stiffness of the metal (by reason of its thickness), prevent telescoping, even though the spring N² O′ were absent.

But in working comparatively thin and soft yielding metal such telescoping would be very liable to occur in the absence of that spring. It would be more liable to occur with thin brass than with thick, because, first, of its flexibility; and, secondly, by reason of the increase in the space between the mandrel and the inner face of the metal.

However, I do not understand that the invention set forth in that fifth claim of the Sprague patent 228,136 would be absent from the defendant's machine, even though it were possible, by the use of thick brass to operate the machine without telescoping the metal, even in the absence of that spring, because the invention would still be present in the machine and the combination be adapted
83 to operate in substantially the same manner as does the corresponding combination in the Sprague patented machine.

C. Q. 31. What do you find in the defendant's machine which answers to or is equivalent for the support which presses the part u of the lever against the rib "m," as described in Sprague's patent No. 231,199, and claimed in the first claim thereof?

A. I find the stationary rib or guide marked n^2, on figure 8^a, Doubleday Drawing 4, and the same part as shown unlettered [in] Doubleday Drawing 5.

In the Sprague patent No. 231,199, marked n^2, figure 6, that tongue is slightly beveled on its upper face, thinnest at its point, in order that when the die is withdrawn the pressure upon the bit of lever may be slightly released to facilitate the sliding of the lever upon the mandrel.

That tongue is very slightly wedging, so that as the die is being advanced to form the bit and the seat grooves it does not practically increase the pressure of the bit against the rib m as the swaging or bending approaches completion and is completed.

This tongue performs two functions, as I understand.

One of these is holding the bit u against the rib of the mandrel while the bending is going on; but this holding or pressure is not limited to a positive, unyielding pressure in that first claim, although it is a positive and rigid tongue as shown.

But in its second function it is dependent upon rigidity and unyielding permanence during the operation of the dies, in order that it may serve as a stop to determine the length of the bit between its griping edge and the seat grooves.

This latter function is made the subject-matter of the third claim in the Sprague patent 231,199, in which that, this last-described purpose and operation of the tongue n^2, is stated specifically.

84 The only practical difference in operation I can discover between the rib or guide in defendants' machine marked n^2, Fig. 8^a, Doubleday Drawing No. 4, and the tongue n^2 in the Sprague patented machine is this:

The Sprague tongue, when withdrawn after the bending or swaging is completed, releases the bit from the firm contact with the tongue and the rib m of the mandrel, which has been produced by the jamming of the metal together as the dies advance, while the defendant's rib or guide is stationary.

But I do not understand that this capability of the tongue of being withdrawn forms any part of the invention which is included or covered by the first claim of that Sprague patent 231,199.

C. Q. 32. Does the stationary guide in the defendant's machine, as shown in the Fig. 8^a, Doubleday Drawing No. 4, and marked n^2, perform any other function than to prevent the folded blank from crowding off from the mandrel toward it when the leg of said blank is engaged under the movable catch m 1^b, thus bending said blank over the rib m of the mandrel?

A. Yes; I think that stationary guide determines with practically absolute certainty the length of the bit of the lever in the same manner as does the tongue N^2 in the Sprague patented machine, the metal being forced in between the guide, the rib m on the mandrel, the stationary die, and the descending movable die.

C. Q. 33. Do you mean to be understood, then, that the stationary guide presses the bended blank against the rib m of the mandrel in the sense that the movable support, as shown in the Sprague patent, presses the said folded blank against said rib m?

A. Yes; I think so.

C. Q. 34. In your answer to cross-question 26, I understood you to give as one reason why you thought Sprague intended
85 to include the folder and matrix in the term two or more dies, as claimed in the third claim of his patent 228,136, that unless he so intended the folder and matrix would be entirely omitted from the combination of parts necessary for forming [the] completed lever from a continuous sheet of metal as therein claimed. In view of that answer, how do you explain the second claim of [the] Sprague patent 231,199, wherein, as I understand, the mandrel is entirely omitted?

A. I do not at present see anything in that second claim referred to which is inconsistent with the construction which I have given to the third claim of patent 228,136.

It does not seem to me that the omission of the mandrel from the second claim of 231,199, which was evidently an intentional omission, is evidence that Sprague intended to jump over a part of the folding and bending mechanism when he took out the third claim of his earlier patent.

It seems to me that omitting the final element in a series of mechanisms, or an element which co-operates with the last dies in a series, is a very different matter from leaving out one of the intermediate elements, which in this case is the first pair of dies, without which the next pair of dies in the series could not perform their work.

C. Q. 35. Do you understand that the movable catch $m\,1^b$, as shown in Fig. 8^b of Doubleday Drawing No. 5, is so constructed as to prevent the folded blank from sliding out from between the dies toward it, or is it simply a catch which holds or prevents the legs of the folder blank from springing apart?

A. I understand that that catch serves to prevent the legs of that blank from springing father apart than they are shown in the drawing, but I do not understand that the upper leg of that blank is in contact with the vertical wall or face of the catch in such manner as to prevent the blank from moving away from the stationary rib n^2 at its opposite end.

C. Q. 36. Did you find in the defendant's machine any stop
86 which engaged the leg or legs of the folded blanks, which served the purpose of preventing said blank from moving out from between the dies in the direction said legs occupied in their position between the dies?

A. I found a rib marked m^3, Fig. 5^a, Doubleday Drawing No. 3, and 5^b, 6^b, Doubleday Drawing No. 5, which, as I understand it, engaged with the end of the lower leg of the blank the fixed rib or guide n^2, same figures engaging with the doubled or closed end of the blank, whereby said blank was prevented from horizontal transverse movement relative to the mandrel, as it (the blank) was being moved longitudinally upon the mandrel.

C. Q. 37. These two stops you have just described in the defendant's machine, which engaged with both ends of the folder blank, are

those which you have stated as being within the fourth claim of Sprague patent No. 231,199, are they not?

A. I so understand it.

C. Q. 38. Are you the same H. H. Doubleday who procured for Mr. Sprague both of the patents in question, and who caused to be prepared the bill of complaint in this case, and who appears as solicitor of record?

A. I prepared and prosecuted the applications upon which these two Sprague patents were granted, and caused the bill of complaint to be prepared at Mr. Sprague's request; had no idea of going upon the record as solicitor, or in any other form as an attorney, and had no knowledge or suspicion that such was the fact until a short time ago. I accidently discovered it by looking at the trial calendar, and I at once wrote the clerk of the court requesting him to take it off, as it was put on without any knowledge or authorization on my part.

(Counsel for defendant desires at this time to give notice that he will amend the answer in this case at the proper time, a copy
87 of which will be served upon the complainant's solicitor before any testimony is taken on behalf of the defendant.)

Adjourned.

Now, on December 15, 1881, at 4 p. m., met pursuant to agreement by telegram of Geo. E. Terry.

Examination of H. H. DOUBLEDAY continued.

Redirect examination:

R. D. Q. Have you any means of determining with more accuracy the date of your visit to Waterbury, Connecticut, when you first saw the buckle-lever machine of which you have testified in operation in defendant's factory, and which you have said was in May or June, 1880? If yea, state.

A. Yes; it was a short time after the date of the grant of the Sprague patent No. 228.136, which is May 25th, 1880. My first examination of the defendant's buckle-lever machine of which I have testified was a few days after May 25th, 1880—between that date and July 1st, 1880.

H. H. DOUBLEDAY.

88 U. S. Circuit Court, District of Connecticut. Sept. Term, 1881. In Equity.

LEONARD A. SPRAGUE, Complainant,
versus
THE SMITH AND GRIGGS MANUFACTURING CO. } No. 317.

Proofs on behalf of respondent for final hearing, taken by consent before Thomson H. Palmer, a notary public for the county of Kings, State of New York, in lieu of a U. S. examiner, at the office of E. W. Williams, in the city of Brooklyn, N. Y., under rule 67, as amended.

Present and consenting thereto: Chas. E. Mitchell, Esq., on behalf of complainant, and Geo. E. Terry, Esq., on behalf of respondent.

BROOKLYN, N. Y., *February 18th*, 1882.

Met pursuant to agreement.

Deposition of EDMUND JORDAN, a witness on behalf of the defendant, [who], having first been duly sworn, upon his oath, in answer to interrogatories and cross-interrogatories, did depose and say:

Q. 1. What is your name, age, residence, and occupation?

89 A. Edmund Jordan; age, 56; reside in Brooklyn, N. Y., and am superintendent of the machine manufactory of E. W. Williams, who is the successor of Bliss & Williams.

Q. 2. How long have you been in their employ?

A. Over ten years.

Q. 3. If you have any knowledge of the firm of Bliss & Williams building a machine for Leonard A. Sprague for the purpose of manufacturing buckle levers, state when it was and describe the machine as nearly as you can remember it.

A. A machine was ordered by L. A. Sprague for Charles Goodyear & Co. It was ordered January 30th, 1874, by our books. We find it charged on the books March 21st, 1874, and was probably delivered about that time. The body of the machine was the same as Bliss & Williams' No. 1½ power press, as made at that time; the shaft of the machine made longer, projecting farther from each side of the frame than the regular press, the extra length of shaft to receive cams for feed motion and the motion for closing dies horizontally; the die plate or bolster made larger and specially arranged to receive dies or tools, according to Mr. Sprague's order and direction. The plans for the alterations were all furnished by Mr. Sprague. Some of the parts and dies were not furnished by Bliss & Williams. The machine left Bliss & Williams' incomplete, and was not put at work in their factory.

Q. 4. Will you look at the drawing, figure 5, of Sprague's patent No. 228,136, dated May 25, 1880, and state in what particulars, if any, that drawing resembles the machine described by you, and designate those portions thereof, if any, by letter that resemble said machine described by you?

A. These B^3 represent the No. $1\frac{1}{2}$ power-press body or frame; B^2, the pulley or fly-wheel; B^1, shaft; cams, g^1 g^4; vertical levers, F and G; bracket, H, carrying levers, F and G; r^3, crank on end of shaft, near the fly-wheel; R^1 r^1 r^2, connection on crank r^3, connecting levers Q Q with crank r^3 for closing horizontal dies; bolster or die plate resting on bed of machine at A. Outside of what I have stated I cannot give the details. We also made the loop on the end of right-hand lever G. The object of this loop was to surround the strip of metal being fed to the machine as the centre of the strip of metal from which the work was cut was in its working position central with the lever G. We did not finish the levers P, as far as I recollect. I remember we planed up blocks of steel for dies.

90

Q. 5. Did you know for what purpose this machine was to be used when finished?

A. For the cutting and forming parts of shoe buckles.

Q. 6. After the delivery of this machine, did you see it; and, if so, where?

A. I saw it at Mr. Sprague's factory, Dunham Place, Brooklyn, E. D. The machine was standing still—not at work.

Q. 7. When was this?

A. Within a year after the machine was made by Bliss & Williams. I should think about three or four months; but am not positive about the time.

Q. 8. Do you know whether at that time the machine was completed and in running order?

A. I do not.

Q. 9. Did it have the appearance of having been run?

A. It did.

Q. 10. Was the machine dismantled or taken apart as though for repair?

A. I don't know; I don't remember.

Cross-examination by Mr. MITCHELL:

X Q. 11. Are you clear that the cam g^4 was upon the shaft B^1 when the machine left Bliss & Williams'?

91

A. No, I am not clear; I don't know whether it was on the shaft or not. I am clear that the shaft was made long to receive the cam.

X Q. 12. Are you clear that the vertical lever F was in the machine when it was delivered by Bliss & Williams?

A. No; I am not clear.

X Q. 13. I suppose it was no part of Bliss & Williams' job to make the dies and other parts that were immediately operative in producing the buckle lever; am I right?

A. It was no part of theirs; there was a contract between Bliss & Williams and Mr. Sprague to make the press; all attachments and feed motions were made by day's work, as Mr. Sprague ordered them from time to time. They made the press at contract price.

X Q. 14. Did Bliss & Williams make the dies?

A. I think not; any more than make blanks for dies.

Redirect examination by Mr. TERRY:

Re-D. Q. 15. In answer to X question 11 you say you are not clear that the cam g^4 was upon the shaft B^1 when the machine left Bliss & Williams'; do you remember whether or not you made such a cam for Mr. Sprague?

A. I do not.

Re-D. Q. 16. Do you remember whether you made a vertical lever F?

A. I do not remember.

EDMUND JORDAN.

Attest: THOMSON H. PALMER,
Notary Public, Kings Co. N. Y.

Adjourned to Friday, Feb'y 24th, 1882, at 89 Broadway, Brooklyn, E. D., at 9 o'clock, a. m.

92 89 BROADWAY, BROOKLYN, E. D., *Feb'y 24th*, 1882.

Met pursuant to adjournment.

Present: For complainant, Chas. E. Mitchell, Esq.; for defendant, M. B. Philipp, Esq., and George E. Terry, Esq.

LEONARD A. SPRAGUE, a witness produced by and on behalf of the defendant, having been duly sworn, testified as follows (said Sprague voluntarily appearing at the request of the defendant):

Examined by Mr. PHILIPP:

Q. 1. State your name, age, residence, and occupation.

A. Leonard A. Sprague; age, 57; residence, Brooklyn, N. Y., and occupation, manufacturer.

Q. 2. You are the complainant herein, are you not?

A. Yes, sir.

Q. 3. You are the Leonard A. Sprague who obtained a patent on the 27th May, 1862, No. 35401, for improved lever buckle, are you not?

A. Yes, I am.

Q. 4. Have you ever manufactured and sold the levers and buckles containing the same, embraced in said letters patent. And, if so, when did you begin to do so, and how long have you so continued?

A. I don't recollect of ever selling any levers of this kind. I have sold those buckles with the levers on for several years—since 1865, I can't tell the precise date.

Q. 5. Where did you make and sell the buckles with levers on them, similar to those in said letters patent?

A. I made them in 41 Centre street, rear building, in the city of New York, and also in Dunham Place, Brooklyn, E. D., N. Y.

Q. 6. How did you make the levers that went with those buckles during all the period of time you have mentioned?

A. By several processes.

93 Q. 7. How did you first make them?

A. Just as I do now—this size and kind—the trunk buckle.

Q. 8. During the period of time you have mentioned since '65, have you not made buckles for other purposes than trunk straps having levers composed of a strip of folded metal similar to the levers described and claimed in your letters patent before referred to?

A. Yes, sir.

Q. 9. When did you begin to make those, and for what purposes, and how long have you made and sold them?

A. I made them in the latter part of the summer and fall of 1862—not just that pattern—for other purposes, and have made them ever since.

Q. 10. For what purposes?

A. Skate straps is one; arctic overshoes—not used as early as that date for them.

Q. 11. How did the levers differ from those shown in the patent that were used with the skate and arctic shoe buckles?

A. Those arctic shoe buckles first used were five-eighths of an inch wide, while those in the patent were wider. The levers of the skate buckles were five-eighths of the pattern in the patent; and some I make with what is called a double action. The tongue is shorter in the rear, and a piece of metal inserted in, which forms a hinge. I am not expert in describing things.

Q. 12. How did you make the levers that were used with the skate buckles in 1862?

A. I first punched a blank out of a ribbon of brass. I then punched two or four holes—some of them four holes and some of them two—in a separate press. Then I stamped the letters on—"Letters Patent"—in another press, and drew them up in a U-shape in another operation. Sometimes I did it in the same and sometimes in a different press. Then I slipped it on what we call the mandrel and put it into another press and pressed it into form.

94 Q. 13. Where were these two or four holes located—at the outer ends of the blank when punched out?

A. One was about one-eighth of an inch from the outer and the other was about three-eighths.

Q. 14. The cutting out of the blank with the holes was performed in a separate press from and disconnected from the other press that drew them up in the U-shape; is that so?

A. At that date it was.

Q. 15. And the pressing of this U-shaped blank into form on a mandrel was done in still a third press, independent of the other two, was it?

A. Yes, sir.

Q. 16. The blank after being punched was conveyed to the second press for bending into U-form, by hand, was it?

A. Yes, sir.

Q. 17. How were these blanks after being bent into U-form conveyed to the third press containing the mandrel.

A. By hand.

Q. 18. During what years did you continue to make the levers

for buckles for skate straps or arctics by three separate presses in the manner you have described?

A. I think it was up to about '68 or '67; I can't tell exactly; somewhere along there. I punched and lettered and cut out in one operation, a little before that time, I think.

Q. 19. Well, when after that time did you make these buckle levers in a different way than by the use of three independent presses, if at all?

A. I made them in two operations—let me see—the fall of 1874 I finished the partially complete arctic buckle; they were not complete, but partially formed so that I used it with a loss of material and time.

Q. 20. How did you make them in the fall of '74?

95 A. I think in the fall of 1874 I run them through the machine, cutting and forming with considerable choking and wasting.

Q. 21. Well, describe exactly what you did, as nearly as you can, in the fall of '74.

A. Well, I put the ribbon in the machine and run it through and turned out sometimes a fair buckle lever, sometimes not, without taking it to another machine.

Q. 22. What was first done to the strip or ribbon of metal, as it was fed to the machine, in the fall of 1874?

A. The two outer holes of the arctic buckle lever were punched.

Q. 23. You mean by the two outer holes the two slots extending across the blank, one on each end, like the slots shown in Figs. 8 and 9 of your patent No. 231,199?

A. Yes; that is what I had reference to.

Q. 24. What next was done in that machine, in the fall of '74, to the ribbon of metal?

A. The word "Pat." was stamped on and I think "1862."

Q. 25. This was done by a separate die from the one that punched the slots, was it, in the fall of '74?

A. Separate punch, but the same die, with letters inserted.

Q. 26. Then how was the punching and stamping done—in one or two operations?

A. It was done in one stroke of the machine.

Q. 27. What was next done to the ribbon of metal thus punched and stamped in this machine in the fall of '74?

A. The blank was cut off.

Q. 28. By the same or by a different die than the one which did the punching?

A. By the same die.

Q. 29. What was then done with the blank thus punched, stamped, and cut?

A. It was forced into a matrix and formed into U-shape with partial success.

Q. 30. Well, what next was done after the blank was thus

96 punched, stamped, cut, and formed into U-shape in this machine in the fall of '74?

A. When the punch receded it was forced forward between two dies by what we termed a driver, when it retained its position.

Q. 31. Over a mandrel or onto what, if anything, was it forced?

A. Onto a mandrel.

Q. 32. What next was done with it, if anything, in this machine in the fall of '74?

A. Pressed with dies and shoved off from the mandrel.

Q. 33. Was it operated upon by one or two sets of dies in this machine in the fall of '74, after it had received its U-form?

A. The early part of the fall; I don't think it was, but it might have been in the latter part of the year or the next year that it was.

Q. 34. From 1867 or '68 up to the fall of '74, how did you make these buckle levers—by the three independent machines and operations that you had used prior to '68 or differently?

A. Two machines, both different.

Q. 35. Were they together or independent of each other?

A. Independent.

Q. 36. What did the first one do?

A. It done as I have described, except putting on a bead on the tail of the lever.

Q. 37. And what did the second one do?

A. Put that bead on.

Q. 38. And how long did you use these two machines prior to the fall of '74?

A. I should think about a year; I have reference to the bead which was formerly not put on buckle levers in that way.

Q. 39. How long did you use the machine that did everything else but put on the bead prior to the fall of '73?

A. I don't think I used it; it was done by other operations.

97 Q. 40. In the same way and by the use of the three independent machines?

A. I don't think I did; two other operations.

Q. 41. What were those?

A. They were formed in the U-shape and drove onto the mandrel and struck in one operation.

Q. 42. All in one machine?

A. No.

Q. 43. Well, how were they made?

A. I have described it.

Q. 44. You have testified that from 1862 to about 1867 or '68 you made these buckle levers by three independent presses, conveying the metal from one press to the other by hand. What I want to know is how you made these buckle levers from between the years '67 and '68 and up to about the fall of '73.

A. One class of buckles were made by two operations, as I told you, but another class, not arctics, was made in one operation.

Q. 45. Well, how was that class made last referred to between '68 and the fall of '73 that were made in one operation?

A. Punched a round hole and cut out, put on a mandrel, and struck.

Q. 46. Where was the round hole punched?

A. About ⅛ of an inch from the outer end; some had two, some had one in each end.

Q. 47. I want you to give such a description, if you can, as will enable the court to understand how this machine which made the lever buckles at one operation worked.

A. It never did work good, so I could do much with it, but I can give you all I can. The ribbon was fed in; first two holes punched in the outer end; "patent" was but on that next; the blank was cut out and forced forward over the matrix, formed into U-shape, and shoved onto the mandrel and struck, when it would do it. When it was struck it formed the lever in an imperfect shape very many times.

98 Q. 48. When was that machine built, and who built it?

A. The press part was built by some parties in New Haven. I don't know who. Mr. Heaton brought the press down; the buckle lever part was afterwards attached to it. I think the first portion was built in '66 or about then, as near as I can remember.

Q. 49. When was the lever making part built?

A. It was so we run it as we did in the latter part of '67; I should think somewhere along there, as near as I can tell.

Q. 50. How long did you run this machine and produce buckle levers by it at one operation? Give the years.

A. For one class of buckles I run it yet, in a different shape, with the improvements; I withdraw that I haven't run it for two years, but I use portions of it now.

Q. 51. Did you use that machine during the year 1868?

A. Yes; I did.

Q. 52. Well, what change did you make in it in '68?

A. I have made so many changes I can't tell.

Q. 53. Well, what changes did you make in that machine in '69, if any?

A. I put in a change to make what we call a tag for a common buckle with a tongue that perforates a strap, to rivet them onto a strap instead of sewing.

Q. 54. Did you use that machine in 1869 to make buckle levers?

A. Yes, sir; and up to two years ago—one class.

Q. 55. Did you make any change in that machine in order to make buckle levers prior to two years ago, when you ceased to use it for buckle levers?

Counsel for complainant objects, on the ground that the witness has previously answered the question in reply to questions 52 and 53, and elsewhere.

99 A. Yes.

Q. 56. Now, when did you?

A. It was during that period; I can't tell.

Q. 57. You made changes, then, as I understand you, in that machine so as to produce buckle levers by it some time between '68 and '80, and you can't tell when?

A. Not all of them, no.

Q. 58. Which of them can you tell, and what were they?

A. I made one change—not successful, though—to put the bead on. I think that was in '70 or '71 or '72; somewhere along there.

Q. 59. Was that the first change you made?

A. No, sir.

Q. 60. Well, what was?

A. I can't tell you the first change; I have changed so much I don't know what the first one was.

Q. 61. What other change do you recollect besides the one to put the bead on?

A. I put in an apparatus to stop the machine when it worked imperfectly.

Q. 62. What other change do you recollect?

A. I put a friction joint in the lever, and I am a little inclined to think that was the first one.

Q. 63. When was that made?

A. Soon after I made the machine; in '66, I think; somewhere along there.

Q. 64. And when was the stopping device put on that machine?

A. I can't tell you the time; a little after; quite awhile after; from one to two years.

Q. 65. Was it before '70, do you think?

A. I hardly think it was, but can't tell.

Q. 66. Who made these changes that you have testified about in this machine?

A. I made them, with the help of my workmen; I always suggested them.

Q. 67. Who were the workmen?

100 A. John Manning, Daniel Mills, Mr. George Styles; I guess that is about the main ones.

Q. 68. Was this the only machine you had for making buckle levers at one operation between '66 and the fall of '74?

A. Yes, sir.

Q. 69. Where are Mills and Styles now?

A. I don't know where Mr. Styles is; I think he was in Yonkers the last I ever heard of him. Daniel Mills went to Vineland, and I have heard he has gone to Europe. It is a long time since I saw either of them.

Q. 70. How did that machine, as it was used prior to the fall of '74, resemble or differ from the machine shown and described in your two patents here in suit?

A. The press part was much heavier and a shorter motion; no shaft to connect levers; no operating cam levers, and various others.

Q. 71. Did it have an automatic feed for the metal?

A. Yes.

Q. 72. Was it different from or the same as that of the machine of your patents?

A. Different.

Q. 73. How did it differ?

A. This: The machine referred to in Fig. 13 of the patent 231,199 worked with a cam; the other did not.

Q. 74. Is that the only difference?

A. No.

Q. 75. Well, what other difference?

A. There is no other essential difference, except the cam.

Q. 76. How was the ribbon-feeding device operated in the machine prior to the fall of '74?

A. One end of the lever was attached to the direct motion of the press up and down running horizontal—upper part; then the part at right angles came down and was attached to the feeding mechanism.

101 Q. 77. How did the dies, as that old machine was constructed and operated prior to the fall of 1874, in their construction and mode of operation differ from those shown at Fig. 13 of your patent 231,199 and described in the specification for punching the holes that were to be near the ends of the lever and for cutting out the blanks?

A. Well, there is one difference: The holes in the die for punching out the round holes for the rivets in the blank are one width of the blank, including the scrap further from the blanking out die.

Q. 78. In which machine?

A. In the new machine.

Q. 79. You mean by the new machine the machine referred to in the patent?

A. Yes, sir.

Q. 80. Was that the only difference?

A. No.

Q. 81. What other difference was there?

A. In the die, where the edge of the ribbon comes along, there is a hole sunk down for the end of the spring to go down in, so that the ribbon won't work under the end of it.

Q. 82. In which machine was that—in the one of the patent or the machine you used prior to the fall of '74?

A. The one of the patent.

Q. 83. Will you please point out in Fig. 13, or any other figure of this patent, the part you have referred to?

A. There (referring to the rectangular portion with hatched lines nearest the letter *l*). If it isn't there it should be there. I haven't read the patent enough to know whether it is specified in it.

Q. 84. Any other difference that you can now point out?

A. It is longer.

Q. 85. Have you now pointed out all the differences that you can testify to between the construction and operation of the dies for punching the holes in the ends of the blank to form the lever, and for punching out the blank as used in the old machine prior

102 to the fall of '74, and as shown and described in your patent No. 231,199?

A. I think I have.

Q. 86. In the machine shown in this patent the blank drops upon what is called a carrier lettered I i i^1, after it is punched from the ribbon for thrusting the blank upon the matrix L, so that it can be bent into U-shape by the folder l^2. Was the blank in the old ma-

chine that you used prior to the fall of '74 transferred in the same way after being cut out?

Objected to as leading.

A. I think it was.

Q. 87. After the blank is bent into U-shape, as described and shown in the machine of your patent 231,199, the new blank just punched passes the U-shaped blank, just previously formed, upon the mandrel M. How was the U-shaped blank pushed upon the mandrel in the old machine used prior to the fall of 1874—in this way or some other?

A. They were not either of them pushed that way. There was a portion of the carrier pushed it.

Q. 88. As shown in the drawings of your patent 231,199 and described in the specification, the blank that has been bent into U-form is pushed upon the mandrel M by the end of the carrier I i i^1 when the latter is moved forward to bring a new blank over the matrix L. Did the old machine that you used before the fall of 1874 have similar devices and mode of operation to produce this result?

A. It had a point on the end of the lower part of the carrier or driver which entered into the lower portion of the U-shaped blank in the matrix for the purpose of holding it down which this patented machine has not. We have other devices for that in the patented machine. Other portions above the point on the carrier fitted the matrix and drove the U-shaped blank out onto the mandrel.

Q. 89. As shown in the drawings of your patent No. 231,199 and described in the specification, after the U-shaped blank has
103 been forced on the mandrel the dies lettered N N^1 are caused to compress the same into the shape shown in figure 8. In the old machine, as used by you prior to the fall of '74, were there dies similarly constructed and operated or not?

A. They were, with one exception; I am not positive about it.

Q. 90 What was the exception?

A. The die that forms the top of the lever; the under part of it had a projection which formed the end of the bite of the lever, and this was made thinner on the outer end so that when it drew back it relieved the pressure on the mandrel. In that respect the patented machine is different from the old machine.

Q. 91. The old machine did not have this projection on one of the dies as used by you prior to the fall of '74?

A. I don't think it did.

Q. 92. What further operation was performed upon the buckle lever before it left the machine in the shape of a buckle tongue, prior to the fall of '74, than was performed by the dies pressing the U-shaped blank over the mandrel, last referred to?

A. I had nothing only the bead; I had made some on the old machine, but without success; it didn't work.

Q. 93. Then in the old machine, after the dies had passed the U-shaped blank upon the mandrel, no further operation was performed

upon the buckle lever except to push it off of the mandrel; was that it, as the machine was used by you prior to the fall of '74?

A. That is all I believe.

Q. 94. Did the mandrel in this old machine, as it was used by you before the fall of '74, have a rib upon the lower portion or not?

A. Yes.

Q. 95. Similar to the rib *m* in Fig. 7 of your patent 231,199?

A. Yes.

104 Q. 96. Did this mandrel also have in this old machine so used a rib similar to that lettered m^2 in that figure of the patent?

A. In one class of buckles it did and in another it did not. It did not work successfully.

Q. 97. What class of buckles was made in that machine when it had the rib similar to m^2 on its mandrel prior to the fall of '74?

A. It was the arctic, not the one that had rivets.

Q. 98. When you made this class of buckle levers and used the rib similar to m^2 in this old machine, what difficulty did you experience that made the machine, as respects this feature, unsuccessful?

A. One feature, it broke the levers that done the pressing, and by not driving onto mandrel true, it wouldn't strike it in the right place and had to be sent back by customers.

Q. 99. In the machine of your patent 231,199, as there shown and described, springs lettered N^2 are interposed between the outer end of each of the dies N N^1 and the inner face of each of the levers that move such dies. Was the old machine you used prior to the fall of '74 similarly constructed?

A. No, sir; it did not have them.

Q. 100. You made buckle levers on this old machine prior to the fall of '74 substantially the same as the levers shown at Fig. 8 of your patent 231,199, did you not?

A. I made some on it; a fair kind of a buckle, but they were not very good.

Q. 101. What did you do with them?

A. Sold them, what I could; what didn't come back.

Q. 102. How many did you sell constructed in that way, and made by this machine, between the year 1866 and the fall of 1874?

A. I can't tell exactly; I sold considerable many; I sold a number of thousand gross.

Q. 103. Is it your best recollection that you sold fifty thousand gross?

Objected to as immaterial.

105 A. No; I didn't, I think.

Q. 104. Did you sell twenty-five thousand gross?

A. I don't think I did.

Q. 105. How many thousand gross, approximately, did you make on this old machine and sell prior to the fall of '74 of the same construction as that shown in figure 8 of your patent No. 231,199?

A. I can't say, because I sold so many of the others with them;

it might be fifteen or twenty thousand gross; it might be more; it might be less.

Q. 106. Answer the same question as to buckle levers like those shown in Fig. 8 of that patent, but having round holes instead of slots at the upper end.

Objected to as immaterial.

A. Well, I should think I sold about the same quantity; pretty near. I might have made more, and I think I did.

Q. 107. How many did you make on that old machine and sell prior to the fall of 1874 with the little ribs at the top, as shown in Fig. 9 of the patent?

A. I think less than a quarter of the other kind.

Q. 108. As many as five thousand gross?

A. It might have been as many as that.

Q. 109. When you made those five thousand gross in that machine which you sold prior to the fall of '74, did you use a second set of dies similar to those lettered O O of your patent 231,199 to produce the little ribs to which I have referred?

A. I used them, but as to the exact quantity I can't tell, but not successfully.

Q. 110. In this old machine as used by you prior to the fall of '74 what pushed the buckle lever off of the mandrel after the dies had pressed it into shape against the mandrel—that is, was it pushed off by the U-shaped blank being pushed onto the mandrel, or otherwise?

A. By the U-shaped blank.

106 Q. 111. Where did you procure the machine referred to in questions and answers from 20 to 33, inclusive?

A. I procured the press, with some of the motion attached, of Bliss & Williams.

Q. 112. When?

A. I think I must have got it in the last of April or the first of May, 1874.

Q. 113. How far was it completed at that time?

A. The press, the main shaft, one of the levers, the lever for driving the carrier, the arrangement for working the levers for operating the striking dies, and the bed of the buckle lever machine was planed for receiving the dies and the working parts of the buckle lever machine.

Q. 114. Who made the various other parts of this machine?

A. My workmen and myself.

Q. 115. After carefully examining your patent 231,199 again, please state wherein that machine, as it was used by you in the latter part of the year 1874, differed, if at all, from the machine described in your said patent and shown therein.

A. The springs between the levers that worked the striking dies are in the patent, but were not in the machine, and this rib m^3 on top of the mandrel which projects over the matrix to keep the U-shaped blank down in position when forced onto the mandrel to keep it true and straight was not in the machine. The point in the

lower side of the carrier or driver is not in the patent, as I used the bar m^3 in its place. It gave me a great deal of trouble and so I changed it. I don't know as I see a great deal more. I don't see anything more that I can describe.

Q. 116. When did you put the springs between the levers and the striking dies in that machine?

A. It was in 1877, in the fall.

Q. 117. When did you put the extension of the mandrel, referred to as m^3 in your patent, in that machine in place of the point on the carrier to hold the U-shaped blank down in the matrix?

107 A. It was either in January or February, 1878; I think it was.

Q. 118. Did you use that machine between the fall of '74 and the fall of '77 for making buckle levers such as are described in your patent 231,199?

A. Yes.

Q. 119. How many did you make during that period of time on that machine?

A. Well, I must have made about fifty thousand gross, as near as I can come at it.

Q. 120. And what did you do with that fifty thousand gross?

A. Sold them. I might have made a few more and I might have made a few less; I can't tell till I look at my books; I could come nearer to it.

Q. 121. Which of the figures of the drawings of your patents in suit illustrates these fifty thousand gross of buckle levers?

A. Figure 9 of 231,199.

Adjourned to to-morrow, February 25th, 1882, at 8.30 o'clock a. m., at the office of Munson & Philipp, 239 Broadway, New York.

NEW YORK, *February 25th*, 1882.

Met pursuant to adjournment, counsel appearing as before.

Adjourned to Monday, March 6th, 1882, at 12 o'clock m.

108 BROOKLYN, N. Y., *March 6th*, 1882.

Met pursuant to adjournment.

Present: For complainant, Chas. E. Mitchell, Esq.; for defendant, M. B. Philipp, Esq.

LEONARD A. SPRAGUE'S direct examination continued by Mr. Philipp:

Q. 122. How many of the fifty thousand gross of buckle levers did you make on the machine the main parts of which you obtained from Bliss and Williams, and sell during the year 1875, similar to that shown in Fig. 9 of your patent 231,199?

A. I couldn't have made over twelve to fifteen thousand gross; I don't think I made over ten thousand gross.

Q. 123. Did you sell those ten thousand gross during that year?

A. I probably sold the most of them—what I didn't carry from one year to the other.

Q. 124. How many of such buckle levers did you make on that machine and sell prior to the month of December, 1876, during that year?

A. I can't tell precisely; if I had known this I would have got my books; I should think it was eight or ten thousand gross; maybe not over eight thousand gross.

Q. 125. When did you cease to use the old machine that you have testified you used up to the fall of '74 for making buckle levers?

A. I think about two years ago; the rivet kind we made on it; maybe a little longer.

Q. 126. Did you make any change in that old machine between the fall of '74 and two years ago, when you ceased to use it to make buckle levers for arctics, the same as those shown in Fig. 8 of your patent 231,199?

A. I did.

Q. 127. When and what change did you make in that old machine?

109 A. I made a change in 1876; changed the extension of the gauge on the mandrel; that must have been later.

Q. 128. What do you mean by changing the gauge on the mandrel?

A. Extend the gauge out over the matrix; that was a late change on it after I had it on the other machine.

Q. 129. Was that the only change in that old machine, after the fall of '74, to make the buckle levers like Fig. 8 of your patent, 231,199?

A. I made some change in the die, but not for this particular buckle.

Q. 130. Question repeated.

A. I don't recollect of any more.

Q. 131. State whether or not this old machine, as used by you between the fall of '74 and December, '76, had in it a second set of dies to put what you call a bead on the upper part of the lever, as shown in Fig. 9 of your patent, 231,199?

A. Yes, sir; I am mistaken about that; I didn't make the lever with the bead on that machine after the fall of '74.

Q. 132. Where was this old machine located when you used it to make buckle levers like Fig. 8 of that patent?

A. It was located in Dunham Place and in 41 Centre street.

Q. 133. How long was it located in 41 Centre street—during what years?

A. 1868 and '67, and whether any earlier than that I don't know; 1868 any way.

Q. 134. When did you move to Dunham Place, Brooklyn?

A. 1869, I think.

Q. 135. And where was this old machine located while it was used, as you have testified, during the whole period from 1868?

A. 18 Dunham Place and 14 Dunham Place.

Q. 136. How long was it so used at 18 Dunham Place—that is, during what years?

A. 1870 to 1874—in the fall.

110 Q. 137. And during what years was it used at 14 Dunham Place?

A. It was not used on that buckle lever, Fig. 8, at 14 Dunham Place. It was used upon that buckle lever with holes instead of a slot up to two years ago, at that place.

Q. 138. Where was the machine made by Bliss and Williams, and which you afterwards completed, first used—at 14 or 18 Dunham Place?

A. 18 Dunham Place.

Q. 139. When did you move to 18 Dunham Place?

A. In 1869, I think.

Q. 140. And how long did you remain there?

A. Up to last November.

Q. 141. [State] whether or not the Bliss and Williams machine, as completed by you was used at 18 Dunham Place in the manner you have described up to November of last year?

A. Yes, sir.

Q. 142. Was it so used in the same room with the old machine or in a different room?

A. In the same room.

Q. 143. How many rooms did you have at 18 Dunham Place?

A. First I had the whole floor of that building—the top floor; then it was divided into half, with a small room off for dipping and tumbling.

Q. 144. When was it divided in half?

A. I ain't positive; some three or four years ago, I guess.

Q. 145. Where were these two machines located in the half of the floor—in the same room?

A. Yes, sir.

Q. 146. State whether or not people came into the room where both of these machines were located and running prior to December, 1876.

A. Yes; people would go in there.

Q. 147. People to sell you brass, or what people?

A. People to sell me brass.

Q. 148. Any others?

111 A. Yes, sir; people from the neighboring factories.

Q. 149. Any people to buy buckles with these levers made with these machines, in them, during that period of time, enter this room?

A. Yes, sir; sometimes.

Q. 150. State whether or not persons entering this room prior to December, 1876, could and did see either or both of these machines at work making buckle levers, as you have testified

A. I suppose some did; they could see them.

Q. 151. [State] whether or not you attempted to keep the operation of these machines secret during this period of time.

A. From parties whom we thought were manufacturing buckles; we endeavored to not let them see them closely.

Q. 152. Answer the question as to other persons?

A. Not from those that we became acquainted with and didn't suppose would want to use any such machine.

Q. 153. Did you sell the buckle levers made in these machines prior to December, '76, at 18 Dunham Place?

A. We did sell some.

Q. 154. To whom?

A. J. W. Mason, of N. Y. city; when he wanted small orders he would sometimes drop in; McCormick; I don't recollect the names of all.

Q. 155. Where were the others sold?

A. In the office at New York; the orders came there.

Q. 156. [State] whether or not the Bliss and Williams machine is still used by you.

A. Yes, sir.

Q. 157. How many machines of the same construction have you now in use?

A. But this one.

Q. 158. Did you make any changes in that Bliss and Williams machine besides the putting in of the springs for the dies, and
112 the extension of the mandrel that you have already testified about, after those changes were made?

A. We put in an adjustable face in the matrix for making the U-blank.

Q. 159. When was that put in?

A. 1878 or '79, I should guess; I can't tell exactly. It was since the patents were applied for.

Q. 160. How many buckle levers did you make on that old machine and sell during the year 1875 and December, 1876, the same as those shown in your patent 231,199, at figure 8, but with holes for rivets instead of slots?

A. Well, I couldn't tell; I should say two or three thousand gross.

Q. 161. How many kinds did you make on that machine during these years?

A. One kind of levers—used it for tags at other times.

Q. 162. In this Bliss and Williams machine was the ribbon of brass fed in on a line parallel with the mandrel, as shown in Fig. 13, or at right angles thereto, as shown in Fig. 1 of your patent, 231,199?

A. As shown in Fig. 13.

Q. 163. How many workmen did you have in your employ between the fall of 1874 and December, 1876, at 18 Dunham Place?

A. I can't tell without reference to the books, but four or five; sometimes six or seven—mostly boys.

Q. 164. How many between 1869 and the fall of 1874?

A. Sometimes I had more and sometimes less. I can't tell just how many; five or six, or sometimes two or three.

Q. 165. Name the workmen you had between the fall of '74 and December, 1876.

A. John Manning was one; John Desman and Will. Clark, and various others; I can't call to mind just the years that they worked for me. Clark is in Boston and Desman is in New York.

113 Cross-examination by Mr. MITCHELL:

X Q. 166. Did you give up trying to make arctic buckle levers on the old machine when you got the new one?

A. Yes, sir.

X Q. 167. You say in reply to question 96 that the old machine did not work successfully on one class of buckles; what class was that?

A. The arctic lever with the bead.

X Q. 168. In reply to questions 36 and 37 you speak of two machines, one to make the buckle lever all except the bead, and the second one to put that bead on. Was this first machine the one that has been called the old machine in your examination?

A. Yes, sir.

X Q. 169. What was the machine that put the bead on?

A. It was a machine run by power with dies pressing onto a mandrel with a rib in it for making the bead. That was all it done.

X Q. 170. If I understand you, all the beaded or arctic buckle levers made by you prior to the Bliss and Williams machine were made partly on the old machine and partly on this beading machine, excepting as you endeavored unsuccessfully to adapt the old machine to do the whole work?

A. Yes, sir.

X Q. 171. After you had completed the new machine in the way described in reply to question 115 in your testimony did you have any practical trouble in its working?

A. Not near as much.

X Q. 172. What had been the trouble up to that time?

A. Forming the bead or telescoping or failing to drive on the mandrel.

X Q. 173. Describe what you mean by telescoping.

A. The buckle levers, when the die formed the first impression
onto the mandrel—the next blank from the matrix has to
174 force that along, and it would spread open and go on the outside of the tongue formerly on there, and what I call telescope.

X Q. 174. Was this telescoping a real practical difficulty in the operation of this machine up to that time?

A. It was, and gave me considerable trouble.

X Q. 175. Did you experiment from time to time to devise means to prevent it?

A. Yes, sir.

X Q. 176. Now, about the trouble in the beading which you say existed up to the time when, in the fall of 1877 and in January or February, '78, you made the change you have described. Please explain what the trouble was.

A. One trouble was that if it was not held in the right position in the matrix it would go onto the mandrel one side longer than the other to match the ribs. It would not come in the centre.

X Q. 177. What would be the result of one side of the bent blank being longer than the other when it went onto the mandrel?

A. It made a bad lever, which was rejected by my customers, and consequently was lost.

X Q. 178. Did you have any trouble from the bead not being made precisely parallel with the slot before you made these improvements of 1877 and '78?

A. Yes, sir.

X Q. 179. How did that come about?

A. One cause that I have described, and telescoping, not being held in the right position in the matrix to be forced onto the mandrel.

X Q. 180. State whether or not it was a very delicate operation to make the bead precisely parallel with the slot, and why?

A. It gave me a great deal of trouble to do it. If it was not forced onto the mandrel evenly it would come that way.

X Q. 181. Did you have any practical trouble in any of
115 these respects after you completed the machine in 1877 and '78 by the changes which you have described?

A. Not when the dies and tools were in order—mandrel, carrier, &c.

X Q. 182. I suppose you mean that the parts were liable to wear and get out of order like other machines; am I right?

A. Yes, sir.

X Q. 183. State whether or not it was your intention while you were experimenting upon and improving this last machine to obtain a patent when it should be completed.

A. It was.

X Q. 184. State whether or not you kept the general public away from this machine while this process of experiment and completion was going on.

A. We did as far as we could any party that we thought would want to use any such machine.

X Q. 185. Is there any more difficulty in making the arctic buckle lever with its slot and bead than in making the lever that had holes in it and no bead?

A. It gave me much more trouble.

X Q. 186. Explain why.

A. The narrowness of the metal between the slot and the outer end made it difficult to keep it upon the rib upon the mandrel and press the bead evenly.

X Q. 187. State whether to complete the machine for making these arctic buckle levers with a slot and bead so that all, or practically all, the levers would come out of the machine with a perfect bead required the later improvements which you put upon the machine.

A. Yes, sir; or I would not have put them on.

X Q. 188. What would be the effect of telescoping upon the machine itself before you devised the improvements which you made in 1877 and 1878?

116 A. It would break the mandrel sometimes, and choke up the machine so that we had to get it out.

X Q. 189. In what way did you get out the telescoping blanks when the machine was choked?

A. Stopped the machine and took a pointed steel with a hook on and drew them back, and sometimes worked them off the further end of the mandrel.

Redirect examination by Mr. PHILIPP:

Re-D. Q. 190. Did you ever have any trouble with the machine in choking after you had made the slight alterations you have spoken about of extending the mandrel and putting in the springs?

A. Yes, sir; some, but it was not near as much.

Re-D. Q. 191. What caused this choking since those alterations—telescoping or what?

A. Sometimes telescoping and sometimes the blank not being cut smooth.

Re-D. Q. 192. In what way did you get out the telescoping blanks when the machine was choked after it was altered?

A. By stopping the machine and using a sharp-pointed hook the same as before.

Re-D. Q. 193. Since those alterations were made have you had any trouble about putting the bead on on account of the blank not going on the mandrel just right in this machine?

A. Yes, sir; when the matrix was worn and the die was worn the die, not cutting smooth, will throw it around.

Re-D. Q. 194. Would the telescoping of the blanks after the alterations were made in this machine also injure the machine; and, if so, what part?

A. The telescoping would produce the same injury as before when it did telescope.

Re-D. Q. 195. How many buckle levers did you lose that you couldn't sell made on this Bliss & Williams machine between the fall of '74 and the fall of '77?

A. I couldn't tell you, as they went into the scraps and we kept no account of them.

117 Re-D. Q. 196. Can't you approximate the number?

A. I don't know as I could. It was considerable.

Re-D. Q. 197. Were there five thousand gross?

A. I shouldn't hardly think there was.

Re-D. Q. 198. Were there three thousand gross?

A. Well, I don't think there was hardly. I don't know; I can't tell. There might have been, but I don't think there was.

Re-D. Q. 199. Were there a thousand gross so lost?

A. Well, I don't know; I can't tell. I should think there was; maybe not and maybe more.

Re-D. Q. 200. How many have you lost, made on this machine

and couldn't sell, since February, '78, and how many have you sold since that time?

A. I can't tell you; I made more buckles but not as much proportion of waste.

Re-D. Q. 201. Can't you approximate the percentage of waste since February, '78, on that machine?

A. I don't know that I can; it is a difficult thing to do.

Re-D. Q. 202. Is it not the fact that the longer this machine is used the more expert the machinist or person who runs it becomes in the making and adjusting of the tools, and the less waste therefore occurs in material?

A. He improves when he commences new, but after he has run it a year he knows about as much as he ever will.

Recross-examination:

Re-X Q. 203. After your machine was completed by the changes of 1877 and 1878, did you have any practical trouble in forming the bead or pushing the blank into the mandrel or from telescoping or from waste when the machine was in good running order and in repair?

A. No, sir; not any practical trouble.

Re-redirect examination:

Re-Re-D. Q. 204. Wasn't the telescoping that you have
118 testified about that occurred in this machine after it was altered by extending the mandrel and putting in the springs a practical difficulty?

A. Yes; one of them.

Re-Re-D. Q. 205. What caused this practical difficulty after those changes were made?

A. There was several. The matrix wearing, the dies wearing smooth, not holding the brass evenly upon the mandrel, and the end of the carrier wearing so as to not force the U-shaped blanks on evenly.

Re-Re-D. Q. 206. And those same things caused the telescoping in the machine before it was altered, didn't they?

A. Yes; and when the dies wasn't worn it would telescope.

L. A. SPRAGUE.

Attest: THOMSOM H. PALMER,
Notary Public, Kings Co., N. Y.

119. U. S. Circuit Court, District of Connecticut. In Equity.

LEONARD A. SPRAGUE

vs.

THE SMITH & GRIGGS MANUFACTURING CO.

Further testimony taken on the part of the defendants before Thomson H. Palmer, notary public, under and by virtue of the 67th rule in equity as amended, pursuant to agreement.

NEW YORK, *April 20th*, 1882.

Present for complainant, Chas. E. Mitchell, Esq.; for defendant, M. B. Philipp, Esq., and Geo. E. Terry, Esq.

HENRY L. BREVOORT, a witness produced by and on behalf of the defendant, having been duly sworn, testified as follows:

Q. 1. State your name, age, residence, and occupation.

A. Henry L. Brevoort; age, 33; residence, New York city; I am by profession a mechanical engineer.

Q. 2. What experience have you had in the practice of your profession, and have you ever been called upon to testify as an expert in cases relating to patents?

A. I have since the age of 18 been engaged in mechanical occupations such as designing and constructing machinery, testing the same, &c. For the last seven or eight years I have been almost exclusively engaged in examining patents and patented inventions, and I have during this period been very frequently called upon to testify in suits relating to patents.

120 Q. 3. Have you examined and do you understand that which is described in U. S. letters patent granted to L. A. Sprague, No. 228,136, dated May 25, 1880, and U. S. letters patent granted to the same inventor, No. 231,199, dated August 17, 1880, both patents being for machines for making buckle levers?

A. I have carefully read both of the patents referred to in the question, and I think I understand that which is described and claimed in the said patents.

Q. 4. Have you examined in the factory of the Smith & Griggs Manufacturing Company, at Waterbury, Conn., a machine for making buckle levers, and do you understand the construction and operation of such machine? And also, if you can, please state whether this is the only machine for this purpose in the said factory.

A. I have, on April 19, 1882, examined at the works of the Smith & Griggs Manufacturing Company, in Waterbury, Conn., a machine for making buckle levers. This machine was in operation when I examined it, and was stopped for the purpose of my examination. I have also been through the various rooms of the Smith & Griggs Manufacturing Company, and I found but one buckle-lever machine in said factory.

Q. 5. Please state whether the said machine examined by you at Waterbury, as testified to in your last answer, does, or does not, in your opinion, contain the invention claimed in the 5th claim of the patent

granted to L. A. Sprague, No. 228,136, dated May 25, 1880; and also please give your reasons for any opinion which you may express.

A. I have carefully made the comparison called for in the question, and I am clearly of the opinion that the machine which I saw in Waterbury does not contain the invention of the 5th claim of the patent No. 228,136.

In giving my reasons for this opinion, I will first state what I understand to be the invention set forth in the said 5th claim.

121 The Sprague patent relates to a machine for making what are known as buckle levers, or what really are tongues intended to hold the strap by friction in contradistinction from penetrating a hole in the strap as does the ordinary tongue used in buckles. These buckle levers are made of brass bent into proper shape, so that one end may be used to bear upon and hold the strap, while the center of the lever is provided with a groove, so that the lever may be pivoted upon the cross-bar of the buckle, and the other end of the lever is provided with means for attaching the strap to the lever. In the patent these buckle levers are formed by punching from a strip of brass a blank of appropriate shape, and having the requisite holes through it, which blank is next formed by a folder and matrix into the shape of a letter U. This U-formed piece of sheet brass is then acted upon by dies on both sides, which form the folded end of the buckle lever into the proper shape to bear upon the strap, and also form the groove which is to encircle the cross-bar of the buckle. The partially formed blank is then passed along and is acted upon by another set of dies which complete the end of the buckle lever to which the strap is to be attached. The U-shaped blank during this operation is passed along upon a fixed mandrel, upon which it is slidden after having been formed into the shape of a letter U by the appropriate folder and matrix.

In the performance of these operations it is necessary that the buckle levers should push each other along the mandrel, and to do this successfully it is expedient that the partially formed lever should not telescope with the levers in front or behind. To provide against this telescoping the dies which first act upon the U-shaped blank are connected by springs with the levers that move the dies up and away from the central mandrel, said spring connection performing the desired function only when the dies are relaxed, the movement of the dies up to the mandrel being a positive mo-

122 tion. In this way, after the buckle lever has been partially formed by the dies and the strain due to the formation of the lever is relaxed, the dies will still, by reason of the springs, press upon the buckle levers and keep them in more or less close contact with the mandrel, so that the danger of telescoping is thus avoided by reason of the fact that the levers are held in contact with the mandrel to a certain extent.

The 5th claim of the patent relates to the combination of the mandrel, marked M in the patent, and against which the buckle levers are pressed by the dies. The claim also includes the first pair of dies used to partially form the U-shaped blank into the completed buckle lever and the two springs which hold the dies up to

the mandrel after positive pressure is relaxed and keep the buckle levers in such position that the danger of telescoping is avoided. In the machine described in the patent to do this work effectively two springs are necessary, one for each half of the die; or, in other words, one to keep the buckle lever against the mandrel on one side and one to keep it against the mandrel on the other side, and, I think, from the specification of the patent and from the terms of the claim, that the invention therein referred to is limited to the use of two movable dies and two springs arranged as described and shown in the patent.

The machine which I examined at Waterbury is a machine for making buckle levers substantially like the buckle levers described in the patent of Sprague. These buckle levers are formed by punching from a strip of metal blanks of proper configuration, which blanks are then brought into U-shape by the proper instrumentalities, and are passed upon a mandrel to be formed into completed buckle levers; but here in substance the likeness between the Waterbury machine and the machine described in the Sprague patent ends, for in the Waterbury machine one movable die and one fixed die, in connection with a mandrel, are sufficient for the com-
123 plete formation of the buckle lever, and four movable dies, or rather two pairs of dies are not essential and are not used.

It may be that the Waterbury machine has the equivalent of the mandrel M referred to in the claim, so far as the invention of that claim goes, although it has a mandrel not having all the parts which are requisite for the mandrel referred to in the patent. It may be, also, that for the purposes of the invention of the 5th claim the Waterbury machine has the equivalent of the dies N N^1 of the 5th claim; but, as there is no spring used in the Waterbury machine in connection with either portion of the single die there used or in connection with the mandrel, I do not think that the said Waterbury machine contains the invention of the said fifth claim, in which the two springs, each acting on one-half of the die, are made by the terms of the claim essentially necessary; consequently I am of the opinion that the Waterbury machine does not contain the invention of the said fifth claim, for the reason that it has not any equivalent for the springs N^2 N^2 referred to in that claim.

Q. 6. Please compare the invention referred to in the first claim of the Sprague patent No. 231,199 with the machine which you saw in Waterbury, and state whether or not, in your opinion, the said machine contains the invention referred to in the said first claim of the Sprague patent above referred to, and in answering this question please give your reasons for any opinion which you may express.

A. I have carefully made the comparison called for in the question, and it is my opinion that the machine which I saw at Waterbury does not contain the invention referred to in the first claim of the patent No. 231,199. Before I give my reasons for this opinion I will first state what I understand to be the invention referred to in the said first claim.

The machine described in this patent to Sprague is, in substance, like the machine described in the early patent, to which my

124 attention was called in the last question, and the object of the machine is to produce substantially the same manufacture. For the purposes of this inquiry, however, the two machines can be considered as identical. The first claim of the patent to which my attention is now called relates to the combination with a machine for making buckle levers of the mandrel M, being, as the claim says, "provided with ribs m m^3." The combination also includes the first and second pair of forming dies which compress the U-formed blank against the two sides of the mandrel, and result in the completion of a buckle lever only when submitted to the action of both dies. The claim also refers to a support which presses the lower part of the partially formed buckle lever against the lower rib of the mandrel, and which support is only used with the pair of dies marked N N^1, and consequently there is no coaction between the support and the dies marked O O, which are the last pair of dies that act upon the buckle lever.

However this may be, the second pair of dies are made an essential element of the claim.

The two ribs referred to in the claim, marked m m^3, are used for two purposes. The rib marked m is the rib which is used for the formation of the groove in the buckle lever which is to surround the cross-bar of the buckle frame, and the rib indicated by the letter m^3 in the claim is described as serving to hold the U-formed blank upon the mandrel when the folder, which presses it into the matrix, rises upwards and is withdrawn. This rib, however, is continued along the mandrel, and I suppose is intended to serve as a limit or stop upon one side of the mandrel for one of the folded wings of the buckle lever, although it is doubtful whether in the operation of the machine it performs this function, for the reason that the creasing and folding in of the metal of the buckle lever tends to shorten the buckle lever and draw the folded ends downward and away from the rib m^3.

125 However this may be, this rib is made an essential element of the claim, as is also the rib indicated by the letter m.

The support which is referred to in the claim, and which is made an essential element thereof, is described as follows in the specification of the Sprague patent:

"Referring to figure 6, it will be understood that the wedging tongue n^2 supports the lower end of the part u of the lever firmly while the dies N N^1 are compressing the metal upon the mandrel; but owing to the wedge shape of this tongue, when the die N is withdrawn from the mandrel the blank is released from upward pressure against the mandrel, so that it can readily be fed forward to the dies O O."

Now, this support, therefore, which is referred to in the claim, is a support which acts only as such while the dies N N^1 are partially completing the folding of the buckle lever, and from the statement just quoted it is evident that such support must be removed when the partially formed buckle lever is to be fed along the mandrel into the proper position to be subjected to the action of the second pair of folding dies, and so far as the Sprague patent goes, either in its

descriptions or its drawings, it would seem that this removing of the support after the action of the dies was essentially necessary to permit the buckle lever to be fed along the mandrel; and, consequently, I think the claim is limited to a support which moves out of the way after the dies have acted upon the buckle lever to partially complete it.

In the machine which I saw in Waterbury I do not find a mandrel provided with ribs m m^3; neither do I find that that machine possesses any equivalent for the dies O O, which are made an essential element of the first claim; and, further, the Waterbury machine does not possess a removable support, which holds the buckle levers up against the mandrel and is then, after the action of the dies, removed so that the buckle levers can be fed forward.

126 The lower die of the Waterbury machine is provided with two ribs, one on the back and one on the front, which ribs hold the buckle lever in the proper position longitudinally during its passage over the mandrel. No such ribs and no equivalent therefor are shown or described in the Sprague patent as applied to the dies. For the reason that the Waterbury machine has not a mandrel provided with the ribs m m^3; for the reason that the Waterbury machine has not got a second pair of dies, referred to by the letters O O in the claim, and for the reason that the Waterbury machine has not got the support which is removed after the action of the dies, and which support is referred to in the claim, I am of the opinion that the said Waterbury machine does not contain the invention of the first claim of the Sprague patent No. 231,199.

Q. 7. Referring to the Sprague patent No. 228,136, please assume that the Waterbury machine which you saw was provided with a spring under the heel projection from the mandrel, adapted to press the mandrel downwards towords the lower half of the die, substantially in the same manner shown in figure 8*b* of Complainant's Exhibit Doubleday Drawing No. 5, and then state whether or not, in your opinion, said Waterbury machine would contain the invention of the said 5th claim.

A. I understand the drawing marked Doubleday Drawing No. 5 and the thing shown at figure 8*b*. If the Waterbury machine was provided with a spring, as there shown, even then, in my opinion, the machine would not contain the invention of the 5th claim of the Sprague patent No. 228,136.

My reasons for this opinion are as follows: The claim refers to two springs which are to act only upon the dies to keep the dies up to each side of the mandrel; and if a single spring was used, as shown in the Doubleday drawing, it would simply be a spring for the purpose of keeping the movable mandrel pressed down-

127 wards towards the fixed half of the die, and this single spring applied to the mandrel would not be an equivalent of the two springs referred to in the claim as applied to the dies, but would be a substantially different construction and a new method of reaching a result reached in substantially a different way by Sprague.

Q. 8. Please state whether the Waterbury machine would or would not, in your opinion, contain the invention of the first claim of the

patent No. 231,199 if altered by the insertion of a spring as referred to in the last question and as shown in figure 8*b* of the Doubleday Drawing No. 5?

A. The machine so altered would not contain the invention of the first claim of the patent No. 231,199. It is unnecessary here for me to recite any reasons, for in the opinion expressed in the previous answer herein I gave at length my reasons why the Waterbury machine did not contain the invention of the claim of the Sprague patent referred to in this question.

The insertion of a spring under the heel or projection from the mandrel, as shown in figure 8*b* of the Doubleday Drawing No. 5, would not bring the said Waterbury machine within the scope of the said 5th claim.

Q. 9. Referring now to the Sprague patent No. 231,199 and the invention claimed in the 1st claim thereof, please assume that the Waterbury machine which you saw was altered by the addition of a second set of dies for completing the formation of the buckle lever while it is sliding along the mandrel substantially as is shown in the Doubleday drawing, marked Doubleday Drawing No. 1, at Fig. 1*a*, and in Doubleday Drawing No. 4, at Fig. 10*a*, in which drawings the upper halves of two dies are shown as formed from one piece of metal.

A. I have carefully made the comparison called for in the question, and I understand the Doubleday drawings referred to and the figures therein shown. Even if the Waterbury machine was provided with the equivalents of the dies n n^1 and O O referred
128 to in the first claim of the Sprague patent No. 231199, said machine would not then contain the invention of the said first claim for the reason that the Waterbury machine would not have a mandrel, which mandrel was provided with ribs m m^3, and would not have the support which acts to support the buckle lever when the dies were compressing it upon the mandrel, and which support, after so acting, is withdrawn and ceases to support the buckle lever and permits it to slide along the mandrel so as to be acted upon by a second set of dies, and consequently for the reason that the Waterbury machine altered as supposed would not possess the special mandrel and special support referred to in the first claim, it is my opinion that said altered machine would not contain the invention claimed in the first claim of the patent 231,199.

Q. 10. Please compare the Waterbury machine altered, as assumed in the previous question, with the invention claimed in the 5th claim of the Sprague patent No. 228,136, and state whether or not said machine would contain the invention of the said 5th claim, giving your reasons for any opinion which you may express.

A. I have made the comparison called for in the question, and I am clearly of the opinion that said machine would not contain the invention of the 5th claim of the Sprague patent referred to. It is unnecessary here to give at length my reasons for this opinion, as in a previous answer, where I compared the Waterbury machine with this claim, I gave my reasons at length, and the mere addition to the machine of an additional pair of dies would not in any way

alter the machine so as to bring it within the scope of the 5th claim of the patent No. 228,136.

Q. 11. Please produce, if you can, a blank as made by the cutting-out dies, a similar blank bent into U-shape, and a similar blank completed by one set of dies as cut and bent into U-form and
129 completed by those three operations in the Waterbury machine that you examined.

A. I now produce first a flat blank as it is punched from a strip of brass. This blank has a tag attached to it and is marked "flat blank." I next produce a blank after it has undergone the second operation and has been folded into U-form, which I mark "folded blank" upon a tag attached thereto. I next produce a completed buckle lever ready to have the strap attached, and which is brought to its present form by the action of one pair of dies in the third and last operation of the machine. I mark this "completed buckle lever" on a tag attached thereto.

Adjourned to to-morrow, April 21st, 1882.

NEW YORK, *April* 21*st*, 1882.

Met pursuant to adjournment, counsel appearing as before.

HENRY L. BREVOORT; examination continued:

Q. 12. Can you state whether or not before the year 1874 or '75 it was old and well known in the art to construct machines for various purposes, which machines punched from a strip of metal flat blanks, which blanks were fed along in the machine and finally brought to the desired shape by the action upon the blanks in the machine of dies, folders, or other shaping instrumentalities?

A. I think it was very old to construct such machines for various uses, many of which machines formed up a blank into the desired shape, after it had been punched from a strip of metal, by dies or other folding instrumentalities, a mandrel serving in connection with the dies to produce the desired shape.

Cross-examination by Mr. MITCHELL:

X Q. 13. I suppose you never saw defendant's machine until the 19th of April, 1882?

A. I never did.

130 X Q. 14. When did you first see letters patent to L. A. Sprague under consideration?

A. I think about the beginning of April, 1882.

X Q. 15. If the rib m^3 were attached at its right-hand end to the die containing the U-shaped matrix instead of being attached at its left-hand end (facing the machine) to the mandrel, would it perform the function of preventing the liability of the blank to rise with the folder in substantially the same way in which that function is now discharged in the Sprague machine?

A. The rib m^3 could, so far as I can see, be separated from the mandrel, of which it now forms an integral part, and could be attached to the matrix, or to some other part of the machine, at either

its right-hand end or its left-hand end; and if this were done and the rib m^3, which would then be an independent piece, was properly located, it would serve to keep the U-shaped blanks in the matrix after they were formed, and prevent them from rising with the folder; but this construction would not accord with the descriptions in the Sprague patents where they both say: "m^3 is a rib projecting from the upper part of the mandrel M," and such construction would certainly not embody that part of the description contained in the first claim of the letter patent where it says: "The mandrel M provided with the ribs m m^3."

X Q. 16. Pardon me if I suggest that my careful study of the Sprague patents for many months had made me acquainted with the descriptive matter to which you refer, and I supposed that my question implied such knowledge. Will you now please answer the question, which was whether or not, in case of the changed support of the rib m^3, it would continue to perform substantially the same function in substantially the same way, so far forth as relates to preventing the withdrawal of the U-shaped blank upon the withdrawal of the folder?

A. Although the counsel seems to have examined the
131 Sprague patents for a greater length of time than I have, he does not seem to have discovered that which I have also not been able to discover, to wit, whether from the specifications of the Sprague patents such a change as he suggests could be made in practice and still leave an operative mechanism.

There is not one word in either of the patents which indicates that such a change could be made. Looking at the thing from a mechanical point of view, I should think the change could be made and the machine would work, but I have never seen it done, and give this merely as my best judgment.

All of the last answer is objected to as irrelevant and non-responsive, excepting the last sentence.

X Q. 17. Your last sentence having indicated a purpose to finally look at this question from a mechanical point of view, and having indicated your opinion that the change could be made and the machine would work, will you now please come to the consideration of my original question, which was whether it would work in substantially the same way in accomplishing the function referred to, viz., the prevention of the withdrawal of the U-shaped blank upon the ascent of the folder?

A. It would work in substantially the same way for the accomplishment of the same purpose, the result being reached through mechanical devices differing from those described and shown in the Sprague patent.

X Q. 18. Let us see about the mechanical means being different. How would the mechanical means become different, the only change supposed being the changed place of support of the rib, the rib still continuing to prevent the withdrawal of the U-shaped blank by interposing its lower face against the upper edge of the leaves of the bent blank?

A. So far as preventing the withdrawal of the U-shaped blank from the matrix, the lower edge would serve the same pur-
132 pose, however the rib might be supported, but whether or not it would serve the same purpose, if it does serve any useful purpose in conjunction with a mandrel, would be another question, for the rib would then be separate from the mandrel, and without an accurate fitting of the parts a space could be left where now solid metal exists, and it seems to me that this might be a material defect in the machine when changed as supposed.

All of the answer objected to excepting the part ending with the word "supported."

X Q. 19. I have not as yet asked you about the discharging of any other function excepting that of preventing the withdrawal of the U-shaped blank, have I?

A. The previous question related to whether if the change was made the same "mechanical means" would be found, and I have answered that the same mechanical means would not be found, irrespective of the question of the functions of the parts.

X Q. 20. I don't understand your last answer. Do you mean to say that the rib m^3 would not be the same mechanical means by whichever end it was supported so long as it presented its under face to the upper edge of the bent blank to prevent its withdrawal from the U-shaped matrix?

A. I mean to say just this: That the two Sprague patents describe, among other things, a single piece of metal, which is so shaped as to form the mandrel, having upon it the ribs m m^2 and m^3, which at different portions performs different functions, and if this piece of metal is split up in parts some of those parts may perform their old functions in the old way, while at the same time other functions which were to be performed by the single piece of metal of Sprague may not be so well performed or might not be performed at all, and consequently I think that in view of the Sprague patents the splitting up of the Sprague mandrel into
133 several disconnected portions would produce a mechanical instrumentality or mechanical means differing from the only mechanical instrumentality or means described in the patent. How different the means would be would depend upon the exact method in which the changes were made, and the exact method of making the proposed change has not been here stated with sufficient definiteness to enable a reliable opinion to be formed.

X Q. 21. I do not understand your last answer, and have not time to study it. As you understand it, does it mean yes or does it mean no to the question asked?

A. It means that if the rib m^3 was split off from the mandrel and supported in some other part of the machine and in some undescribed way that the result would be a different mechanical instrumentality from that described by Sprague in that m^3 would then become a separate instrumentality distinct from the mandrel.

X Q. 22. Would not the piece of metal which is marked m^3 in the two Sprague patents, if separated from the mandrel and attached

at the other end, perform identically the same function in so far as resisting the withdrawal of the U-shaped blank from the matrix is concerned, whether said piece of metal formed a part of the mandrel or was attached as an independent piece of metal to some other part of the machine; and in this question I call your attention to the fact that I am considering but this one function of the piece of metal marked m^2 in the Sprague patents, and would not the mechanical means be *quoad* that function substantially the same?

A. It would perform identically the same function, but it would not be identically the same instrumentality.

X Q. 23. Do you, or do you not, by the last part of your last answer mean to be understood that in the case supposed in the last question the piece of metal which is marked m^3 in the two
134 Sprague patents would be a different mechanical means if supported at one end from what it would be if supported at the other end, there being no change of function or in any other respect excepting as stated?

A. It would be the same mechanical means only in that it might be the same piece of metal, but it would not be the same mechanical means when considered in connection with the mandrel and the ribs m m^2.

X Q. 24. Since the exception contained in your last answer excludes the function to which I have been calling attention, I shall try to be content with it as a roundabout way of saying that the *quoad* functions I have referred to, the mechanical means, are the same in the two supposed cases, and will now direct attention to the function of the rib m^3 in other relations. The rib m^3 holds the U-shaped blank in its proper relation breadthwise of the mandrel when the U-shaped blank is struck by the die, doesn't it?

A. I presume that is its intention, though it is not so described, as far as I can find in the specification.

X Q. 25. The mandrel in the arrangement described in the Sprague patent is the fixed member of the blank-shaping system, is it not?

A. Yes.

X Q. 26. In defendant's machine, however, one of the shaping dies is fixed, and the mandrel and the other die are movable (I refer to the machine you saw), are they not?

A. Yes.

X Q. 27. And m^3 so far forth as it operates to prevent the movement of the blank breadthwise of the mandrel is taken from the fixed member of the arrangement described in the Sprague patent, and transferred to the fixed member of defendant's arrangement, is it not, to wit, the lower die?

A. There is a ridge upon the lower die in the defendant's machine which tends to keep the blank in the correct position
135 breadthwise, but I do not consider that this projection is the equivalent of m^3, although it may serve the same purpose. The rib m^3 in the Sprague patent is to be a projection from the mandrel, and is intended to serve two purposes, I presume, one of these purposes being the holding of the U-formed blank in the ma-

trix, and the other being the holding of the blank breadthwise. Now, in the defendant's machine the ridge on the lower die holds the blank breadthwise, but has nothing to do with the holding of the blank against the upward pull of the folder, and, consequently, in view of the description of Sprague, I do not think that the defendants have merely transferred the rib m^3 of the mandrel to their lower die.

X Q. 28. Since my question was limited to the function of m^3, so far as it operates to prevent the movement of the blank breadthwise, I hardly think we disagree to that extent, and will therefore proceed to consider the function of the springs N² N². In the Sprague machine those springs carry the dies against the mandrel with a yielding pressure, so as to at once permit a free movement lengthwise of the mandrel, and at the same time tend to prevent telescoping, do they not?

A. Not attempting to answer the first branch of the question, but confining myself to the last part of the question, my answer is yes.

X Q. 29. And in defendant's machine, as represented by Mr. Doubleday (I refer specially to the spring N² of figure 8ª of Doubleday Drawing No. 4), the object of the spring is to hold the mandrel against the lower die with a yielding pressure, so as to at once permit a free movement lengthwise of the mandrel, and at the same time tend to prevent telescoping, is it not?

A. I do not know why the spring marked in Mr. Doubleday's drawing N² was put into the defendant's machine. Whatever it did in that machine it did not prevent telescoping, which was provided for by entirely different mechanical instrumentalities.

136 X Q 30. Do you mean that punching one or more of the leaves of the blanks between the mandrel and the die or dies would not have a tendency to prevent the end of one blank overlapping the other blank?

A. It might have had that tendency were the blanks left free upon the lower die, but in the defendant's machine the blanks are never so left, but are always held under tension between the stationary die and the sliding catch, and the pressure of the mandrel would be useless in holding the blanks in a proper position to prevent telescoping. The sliding catch to which I refer is shown in Doubleday Drawing No. 5, in the three upper figures thereof, as acted upon by the large horizontal spiral spring.

X Q. 31. Then you agree that in defendant's machine the tendency to prevent telescoping depends upon a spring?

A. Yes, it depends upon a spring which actuates a catch which controls the blank positively, and not by the yielding action of the spring, as in the complainant's machine as described in both patents.

Redirect examination:

Re-D. Q. 32. How long did you see the defendant's machine at Waterbury in operation, and was there any tendency of the blanks to telescope in passing through the machine, or did such blanks telescope, or was there any liability of their telescoping, as the machine was operated?

A. I saw the machine in Waterbury in operation at different intervals during a space of two hours, making buckle levers very rapidly, and I did not perceive any tendency of the buckle levers to telescope, and, as a matter of fact, none did telescope while I was watching the machine; and, in my opinion, the machine was so constructed that there was no liability of the buckle levers to
137 telescope. The machine worked smoothly and perfectly while I was watching its operation.

HENRY L. BREVOORT.

Attest: THOMSON H. PALMER,
Notary Public.

I, Thomson H. Palmer, notary public for the county of Kings, State of New York, with certificate filed in New York county, do hereby certify that the above-named Edmund Jordan, Leonard A. Sprague, and Henry L. Brevoort were sworn to testify the truth, the whole truth, and nothing but the truth, and that the foregoing depositions subscribed by them were taken at the times and places therein mentioned, and were reduced to writing by me in their presence.

Witness my hand and seal this 22d day of April, 1882.

[SEAL.] THOMSON H. PALMER,
Notary Public.

138 United States Circuit Court, District of Connecticut. In Equity.

LEONARD A. SPRAGUE
vs.
THE SMITH AND GRIGGS MANUFACTURING COMPANY. } No. 317.

Proofs on behalf of respondent for final hearing, taken by consent before Edward F. Cole, Esq., a notary public for the State of Connecticut, in lieu of an U. S. examiner, at the office of George E. Terry, in the city of Waterbury, under rule 67, as amended.

Present: —— ——, on behalf of complainant, and George E. Terry, Esq., on behalf of respondent, this 24th day of April, 1882, at 2 o'clock p. m.

Deposition of HUGH LAWTON, a witness on behalf of the defendant [who], having been duly sworn, upon his oath, in answer to interrogatories and cross-interrogatories, did depose and say:

Q. 1. What is your name, age, and occupation?

A. Hugh Lawton; age, 42; reside in Waterbury; am employed by The Smith & Griggs Manufacturing Co., and have charge of all their machinery and tools.

Q. 2. How long have you been in their employ?

A. About two years and five months.

Q. 3. Are you familiar with the buckle lever machine used by them, and have they had any other machine than the one now used by them?

A. Yes; I am familiar with it. They have had no other machine since I have been in their employ.

139 Q. 4. Has the machine as they are now using it any spring under the heel or projection of the mandrel?

A. No.

Q. 5. Do you know when it was taken out?

A. Yes; early in January of this year.

Q. 6. What effect, if any, has it had on the practical operation of the machine?

A. No effect, so far as I can see.

Q. 7. Is there any greater tendency of the blanks to telescope now than when the spring was under the heel of the mandrel?

A. No.

Q. 8. In your judgment, did the spring have any practical effect in preventing the blanks from telescoping?

A. It did not.

Q. 9. How much of the time since the spring was taken out has the machine been in actual operation?

A. Probably two-thirds of the working days since that time.

Q. 10. Has any other change been made in the machine to take the place of the spring or to perform the function of preventing the blanks from telescoping?

A. No.

HUGH LAWTON.

I, Edward F. Cole, notary public for the State of Connecticut, do hereby certify that the above-named Hugh Lawton was sworn to testify the truth, the whole truth, and nothing but the truth, and that the foregoing deposition subscribed by him was taken at the time and place therein mentioned, and was reduced to writing in his presence.

Witness my hand and seal this 24th day of April, 1882.

[L. S.] EDWARD F. COLE,
Notary Public.

140 And at the term of said court held at New Haven, on the 4th Tuesday of April, 1882, the complainant, by C. E. Mitchell, Esq., his attorney, duly appeared to prosecute said suit, and the defendant, by George E. Terry, Esq., its attorney, also appeared, and said cause was fully heard. And on the 13th day of July, 1882, the court filed its opinion in the words and figures following, viz:

141*a* Circuit Court of the United States for the District of Connecticut.

LEONARD A. SPRAGUE
v.
THE SMITH & GRIGGS MANUFACTURING COMPANY.

SHIPMAN, *J.:*

This is a bill in equity, founded upon the alleged infringement of letters patent No. 228,136, dated May 25th, 1880, and letters patent

No. 231,199, dated August 17th, 1880, for improvements in machines for making buckle levers. Buckle levers are the part of a buckle which is so made as to hold the strap by friction, being a substitute for the ordinary buckle tongue which penetrates a hole in the strap. They are extensively used upon "arctic" rubber shoes. The two patents are for different parts of the same complex machine.

It is not denied that the defendant has infringed the first, third, and fourth claims of No. 228,136, and the second, third, fourth, and fifth claims of No. 231,199. Infringement of the fifth claim of the earlier patent and of the first claim of the later patent is
141*b* denied.

Although, as is apparent from the defendant's admission in regard to infringement, the two machines are very similar, they differ somewhat in form. In the plaintiff's machine after the two slots have been punched in the blank and it has been bent into a U-shape and has been thrust upon the end of a mandrel, a pair of movable dies "are advanced, one on either side of the mandrel and blank, on lines substantially at right angles to the flat sides of the U-shape and of the mandrel. These dies have their engaging faces—that is, the faces that engage with the U-shaped blank—of such form and contour that when acting upon the U-shaped blank in combination with the mandrel they bend or swage it into" a partially formed lever.

In the defendant's machine, after the U-shaped blank had been pushed upon the end of the mandrel "there were two dies, one on either side of the mandrel, opposite to this U-shaped blank; one of the dies—the lower one—being stationary in close proximity to the mandrel; the other die—the upper one—reciprocating vertically; the opposing faces of these dies having a configuration the reverse
141*c* of that part of the mandrel occupied by the U-shaped blank, and having, also, portions of their surfaces adapted to form the bit of the buckle lever. As soon as the U-shaped blank was placed on the mandrel the upper movable die descended, and by means of this die, the lower stationary die, and the mandrel, the U-shaped blank" was bent into the same partially formed lever which was produced by the corresponding operations of the plaintiff's machine. In the plaintiff's machine the sides of the mandrel and the faces of the dies are vertical, while in the defendant's machine the mandrel is horizontal, with a stationary die below it and a vertical reciprocating die above it.

The fifth claim of patent No. 228,136 is as follows:

"In a machine for making buckle levers the combination, with the mandrel *m* and dies N N^1, of the springs N^2 N^2 to press the dies forward into proper position relative to the mandrel, substantially as set forth."

In the plaintiff's machine there are two things connected
141*d* with the dies "to press the dies forward into proper position relative to the mandrel" when the dies are not swaging the metal. The object of this pressure is said in the specification to be "in order that a slight looseness of the operating parts

shall not permit the dies to be so far thrust backward as to permit the buckle levers to telescope or overlap each other as they push each other forward upon the mandrel.

In the defendant's machine, as used when this action was commenced, there was one spring "interposed between a bed-plate and an arm of the mandrel support to hold the mandrel in close contact with the lower stationary die, and to press the mandrel and blanks downward towards or upon the lower die" for the purpose of preventing the blanks from telescoping as they are being thrust along upon the mandrel. This spring has been removed, and, it is said, without injury to the efficiency of the machine, but it is plain that the object of introducing the spring was to prevent telescoping. The substitution of one spring for two, and the location upon the mandrel instead of upon the dies are immaterial variations
141e of the form of this part of the mechanism.

The first claim of No. 231,199 is as follows:

"In a machine for making buckle levers the combination of the mandrel m, provided with the ribs m m^3, of the dies N N^1 O O and a support which presses the part u of the lever against the rib m, substantially as set forth."

In the specification the support is described as follows: "It will be understood that the wedging tongue N^2 supports the lower end of the part u of the lever firmly while the dies N N^1 are compressing the metal upon the mandrel; but, owing to the wedge shape of this tongue, when the die N is withdrawn from the mandrel the blank is released from upward pressure against the mandrel, so that it can be readily fed forward to the dies O O."

In the defendant's machine the support is not fixed to the movable die, as in the plaintiff's mechanism, nor is it yielding. It is attached to the fixed die and performs the office which is described in the first claim.

141f The defendant's expert thinks that its machine does not infringe this claim, because the mandrel is not provided with the rib m^3, and because the second pair of dies O O does not exist, and because the support is not removed after the action of the dies.

The rib m^3 in the defendant's machine is on the fixed die, which is the stationary part of that machine, while the mandrel is the stationary member of the plaintiff's forming mechanism. The ribs have the same office in the two machines. The dies O O were formerly on the plaintiff's machine, but have been removed since this suit was commenced.

So far as is disclosed in the testimony, the patented machine was the first one to make "beaded" arctics in one operation. The patent was not confined to the mere form of mechanism which the inventor adopted, and the "support" is not limited by the first claim to one which moves away after the action of the dies.

The main defense is that the two patents, Nos. 228,136 and 231,199, with the exception of the fifth claim of the former and the
141g first claim of the latter, are void, because the machine, with the exception of the mechanism described in said claims, was

in public use for more than two years before the date of the application for letters patent. But one application, dated December 2d, 1878, for a patent upon the entire machine was originally brought. This was afterwards divided into two applications upon different parts of the same machine. In order to defeat the patents, the machine must have been in public use before Dec'r 2, 1876. (Graham *v.* McCormick, 21 O. G., 1533.)

The facts are that from 1862 to 1868 the patentee made another kind of buckle from those produced by this machine upon two or more different machines. Between 1868 and the fall of 1873 another kind of buckle was made by one machine. For a year prior to the fall of 1874 he made the "beaded" buckles—*i. e.*, the kind now under consideration upon two machines.

In 1874 he ordered the skeleton of the patented machine from Bliss & Williams, his workmen or himself making the pat-
141*h* ented portions. The machine was in a condition in which it was used to manufacture buckle levers in the fall of 1874, and contined to be so used without substantial change until the Spring of 1878, but it was not a perfected invention. It had two defects, one that it choked, and the overlapping blanks had to be picked apart by a workman; another, that the bead was not parallel with the slot, because the blank could not be forced upon the mandrel evenly. Nevertheless it was used, in some seclusion from the public, to make levers, and it made about 50,000 gross, which were sold, but the organization was defective until it was perfected in the early part of 1878, after repeated experiments. The inventor always adhered to the idea of perfecting the invention and then obtaining a patent upon it. The two improvements which were introduced in 1878 were the springs between the levers and the dies, which prevented overlapping, and the rib m^3 in order to keep the blank in position when it was forced upon the mandrel. These changes, which are apparently not of great importance, perfected the invention and enabled
141*i* the inventor to take the final step between partial and complete success.

It is perfectly true that a patentee cannot be permitted to use for profit a machine which embodies a perfected invention for a period of two years or more, and then obtain a valid patent for the old machine by means of the addition of some new improvements, which, in the language of Judge Lowell, "were intended to benefit the patent rather than the machine."

The present case is that of a machine which was imperfect and which demanded and received the continuous experiments of the inventor to remedy the defects in its organization. It is not true that the inventor cannot safely use for profit such a machine in its imperfect state lest two years should elapse during the experimental period before the invention is completed and the patent is applied for.

The plaintiff is entitled to a decree for an injunction and for an accounting.

Charles E. Mitchell, for the plaintiff; George E. Terry and M. B. Philipp, for the defendant.

142 And on the 29th day of July, 1882, the following interlocutory decree was made and entered in said cause, viz:

Circuit Court of the United States, District of Connecticut. In Equity.

LEONARD A. SPRAGUE

vs.

THE SMITH & GRIGGS MANUFACTURING COMPANY.

At a regular term of the circuit court of the United States for the district of Connecticut, begun and holden at New Haven, in said district, on the fourth Tuesday of April, A. D. 1882, to wit, on the 27th day of July, 1882—present, Hon. Nathaniel Shipman, district judge—this cause having come to be heard upon the bill of complaint herein, the answer thereto of the defendant, The Smith & Griggs Manufacturing Company, the replication of the complainant to such answer, and the proof, oral, documentary, and written, taken and filed in said cause, and having been argued by counsel for the respective parties:

Now, therefore, on consideration thereof it is ordered, adjudged, and decreed, and the court doth hereby order, adjudge, and decree, as follows, to wit:

That the letters patent No. 228,136 granted and issued on the 25th day of May, A. D. 1880, to Leonard A. Sprague and the letters patent No. 231,199 granted and issued on the 17th day of August,
143 A. D. 1880, to the said Sprague, each and both the said letters patent being the letters patent referred to in the bill of complaint herein, are good and valid in law.

That the said Leonard A. Sprague was the first and original inventor and discoverer of the new and useful improvement in machines for making buckle levers, as described and claimed in the said letters patent and the specifications thereto annexed, and is the exclusive owner of said patents.

That the said Smith & Griggs Manufacturing Company, defendant herein, has infringed upon the first, third, fourth, and fifth claims of said patent No. 228,136 and the first, second, third, fourth, and fifth claims of patent No. 231,199, and upon the exclusive rights of the complainant under the same.

And it is further ordered, adjudged, and decreed that the complainant do recover of the defendant the profits, gains, and advantages which the said defendant has received or made, or which have arisen or accrued to it, as well as all damages in excess of profits sustained by the complainant from the said infringement of the said claims of said patents by the manufacture or use of the machines for making buckle levers containing said improvements as described and secured by the aforesaid letters patent since the 25th day of May, A. D. 1880.

And it is further ordered, adjudged, and decreed that the said complainant do recover of the defendant his costs and charges and disbursements in the suit, to be taxed.

And it is further ordered, adjudged, and decreed that it be referred to E. E. Marvin, Esq., one of the masters of this court, residing in the city of Hartford, he being especially familiar with the matter of investigating profits and damages upon the infringement of patents, and both parties having agreed upon his appointment, which are special and sufficient reasons therefor, to ascertain and take and state and report to the court an account of the number of said machines for making buckles levers made or used by the said defendant
144 and of the number of buckle levers made by the defendant thereon, and also the gains, profits, and advantages which the said defendant has received or which have arisen or accrued to *him* since the 25th day of May, A. D. 1880, as well as all damages in excess of profits sustained by the complainant from infringing the said exclusive rights of the said complainant by the manufacture or use of the said letters patent.

And it is further ordered, adjudged, and decreed that the complainant, on such accounting, have the right to cause an examination of said defendant, *ore tenus* or otherwise, and also the production of the books, vouchers, and documents of said defendant, and that the said defendant attend, by its proper officer, for such purpose before said master from time to time as said master shall direct.

And it is also further ordered, adjudged, and decreed that a perpetual injunction be issued in this suit against the said defendant restraining it, its agents, clerks, servants, and all claiming or holding under or through it, from making or selling or using, or in any manner disposing of, machines for making buckle levers containing said improvements described in said letters patent, pursuant to the prayer of the said bill of complaint.

N. SHIPMAN,
District Judge.

145 And on the 29th day of July, 1882, a writ of injunction was issued in the words and figures following, viz:

United States Circuit Court for the District of Connecticut. In Equity.

LEONARD A. SPRAGUE

v.

THE SMITH & GRIGGS MANUFACTURING COMPANY.

The President of the United States of America to the Smith and Griggs Manufacturing Company, Greeting:

Whereas it has been represented to us in our circuit court of the United States for the second circuit and district of Connecticut that letters patent of the United States numbered 228,136, dated May 25th, 1880, and letters patent numbered 231,199, dated August 17th, 1880, were issued in due form of law to Leonard A. Sprague for improvements in machines for making buckle levers, and that you, the said The Smith and Griggs Manufacturing Company, respond-

ent herein, your officers, servants, and agents, or some of
146 you, have made and used and sold machines for making buckle levers embodying the invention described in the first, third, fourth, and fifth claims of said patent No. 228,136 and the first, second, third, fourth, and fifth claims of patent No. 231,199, contrary to the form of the statute in such case provided:

Now, therefore, we do strictly command and enjoin you, the said The Smith & Griggs Manufacturing Company, and all and sundry your officers, agents, servants, and workmen, under the pains and penalties which may full upon you and each of you in case of disobedience, that you forthwith and altogether desist from making, using, or selling, or in any manner disposing of, machines for making buckle levers containing and embodying the inventions and improvements described and claimed in the first, third, fourth, and fifth claims of letters patent No. 228,136 and the first, second, third, fourth, and fifth claims of letters patent No. 231,199, each granted to said Leonard A. Sprague, in violation and infringement of said complainant's exclusive rights.

Witness the Honorable Morrison R. Waite, Chief Justice of the Supreme Court of the United States, at Hartford, Connecticut, this 29th day of July, A. D. 1882.

[SEAL.] E. E. MARVIN, *Clerk.*

147 DISTRICT OF CONNECTICUT, *ss:*

WATERBURY, *August 1st*, 1882.

Then and there I made service of this order of injunction by leaving a true and attested copy thereof in the hands of Edward S. Smith, the secretary & treasurer of the within-named "The Smith and Griggs Manufacturing Company," in said town of Waterbury.

Attest: GEO. R. BILL,
Deputy Marshal.

Fees:

Travel, 64 miles	3 84
Service	2 00
Copy	1 00
	$6 84

148 And on the 17th day of March, 1883, master's report and evidence was filed in the words and figures following, viz:

United States Circuit Court, District of Connecticut. In Equity.

LEONARD A. SPRAGUE
vs.
SMITH & GRIGGS MANUFACTURING COMPANY.

Accounting. (Order issued September 19, returnable October 3, 10 a. m.)

HARTFORD, *Oct.* 3, 1882.

Parties met for accounting.

C. E. Mitchell present for complainant; George E. Terry for defendants.

Defendants ordered to complete their statement of manufacture and sales, and to serve copy of same on complainant's solicitor on or before Tuesday, Oct. 10, 1882, at noon.

Hearing adjourned, to meet at master's office October 16, 10 a. m., unless complainant's solicitor gives master notice that he prefers to have the hearing at Waterbury, in which event the hearing is to be at same hour, at the office of defendants' solicitor, at Waterbury.

HARTFORD, CONN., *Oct.* 16, 1882.

Present: Mr. Mitchell, for complainant, and Mr. Terry, for defendant.

149 *Defendant's Statement of Manufacture. Returned by Defendant, Sworn to by Edward S. Smith, and Filed and Marked Exhibit A.*

United States Circuit Court, District of Connecticut. In Equity.

LEONARD A. SPRAGUE

vs.

THE SMITH & GRIGGS MANUFACTURING COMPANY.

To the defendants or its solicitors:

The defendant will please take notice that on the 3d day of October, A. D. 1882, at 10 o'clock in the forenoon, at my office in Hartford, Connecticut, I will proceed to take and state an account of all the profits, gains, and advantages which you have received or made or which have arisen to you from the infringements adjudged by the decree herein you have committed upon the 1st, 3d, 4th, and 5th, claims of the patent No. 228,136 to the plaintiff, dated May 25th, 1880, and the 2nd, 3d, 4th, and 5th claims of patent No. 231,199 to the plaintiff, dated August 17th, 1880, as well as all damages in excess of profits sustained by the complainant from said infringement of the said claims of the said patents by the manufacture or use of the machines for making buckle levers containing the improvements described and secured by the aforesaid letters patent since the dates of their issue.

And as the preliminary step in said accounting you are required on said day of hearing to present a statement of all the profits you have made by the infringements aforesaid sworn to by the officer of your company having the most full personal knowledge of
150 all the costs of manufacture and of all the avails of sales, or of all gains by the use of the machines for making buckle levers, containing or embodying the improvements described in said claims of said patents, which statement you shall then and there be prepared to substantiate and verify by all your books, vouchers, and papers which can show the same now in your possession, and by such officers of your company as shall have full knowledge thereof, who shall then and there make such explanation and submit to such examinatian under oath as shall then be required.

Dated at Hartford this 22nd day of September, A. D. 1882.

EDWIN E. MARVIN,
Master, pro hac vice.

WATERBURY, *September 27th*, 1882.

Service accepted.

GEORGE E. TERRY,
Attorney for Smith & Griggs Manufacturing Company.

151 L. A. SPRAGUE *vs.* SMITH & GRIGGS M'F'G CO.

To E. E. Marvin, Esq., master in the above cause:

The defendants hereby make return of the number of buckle levers made and sold by them on the infringing machine from the 25th day of May, 1880, to the 31st day of July, 1882, as follows:

1⅛-in. arctic shoe buckles	24,472	gro.
" " "	8,828	"
" " "	2,351	"
" skate buckles	3,407	"
	39,058	"

That no profit has been derived from the use of said machine in the manufacture of said levers; that the cost of producing (exclusive of the cost of metal) said levers on said machine was two and one-third (2⅓) cents per gross, while the actual cost of producing them by hand—first punching the blanks on a power press and forming them afterwards in a foot press—does not exceed the sum of two (2) cents per gross.

The method of computation is as follows:

152 The machine would produce per day 150 gro. of levers, at a cost of $3.50 per day for a skilled workman, including time of machinist to run it. Upon a power press 200 gro. of levers can be cut per day, at a cost of $1.50 for labor, and the cost of forming in foot press is 1¼ cents per gro.

But one infringing machine is or has been in the possession or use of the defendants between the aforesaid dates.

Waterbury, October 9th, 1882.

THE SMITH & GRIGGS M'F'G CO.
EDW'D S. SMITH, *Treas'r.*

HARTFORD, CONN., *Oct.* 16, 1882.

Personally appeared Edward S. Smith and made oath that the above and foregoing statement is correct and true. Before me—

E. E. MARVIN, *U. S. Com'r.*

153 EDWARD S. SMITH sworn:

Am treasurer and manager of defendants; have been since 1875. Defendants commenced to make arctic shoe buckles of the kind in question somewhere in September, 1879. It may be a little before that, but that is the nearest recollection I have. They began by making them on the machine in controversy; they made some in another way prior to the decision in this case. My impression is that they did prior to the bringing of this suit; cannot tell certain here so far as I can now state.

Certainly they were made on the infringing machines down to the bringing of this suit; unable to distinguish those made on the machine from those not, because we had certain grades that were all made on the machine and other grades made by another process. The grades made by another process were those made to rivet on shoes.

Int. 1. These other buckles had the double bead and slot that are formed in the buckle produced by the infringing machine, did they not—that is to say, the double bead between the slot and the edge?

Ans. Yes.

Int. 2. Give the names of the purchasers of the 39,058 gross of buckle levers returned in Exhibit A.

Ans. L. Candee & Co., New Haven; the Goodyear Metallic Rubber Shoe Co., Naugatuck; the Goodyear Rubber Glove Co., New York; the Boston Rubber Shoe Co. of Boston, Mass.; the National Rubber Co. of Bristol, R. I.; the Union Hardware Co. of Wolcottville, Conn.; Hope & Stevens, New York city; Samuel Winslow, of Worcester, Mass.; and some other small trade I can't think of.

Int. 3. Did you sell any arctic buckle levers apart from the buckle itself?

Ans. No, sir.

154 Int. 4. Each arctic shoe buckle is composed of a buckle frame and lever, is it not?

A. Yes, sir; the frame is made of malleable iron. We purchased the frames of the Elizabethport Manufacturing Company, N. Y.; not wholly. We purchased one lot of O. A. Terry, of Terryville, but the larger part of them had to be thrown away. I think we did not return them to Terry & Co. They made a large allowance on them, and we used what we could of them; bought no buckle frames of other parties.

Int. 5. What did the buckle frames cost you?

Ans. I bought them on a confidential contract, and I decline to state what they cost.

Int. 6. What price was obtained for the 24,470 gross $1\frac{1}{8}$-in. arctic shoe buckles stated in Exhibit A?

Defendants object to any testimony as to the prices obtained for manufactured completed buckles, there being no claim that said buckle, but that only one of its completed parts, *were* manufactured on the infringing machine, neither of which parts nor the complete buckle being patented, nor any claim made that they infringe any rights of the complainant. Objection overruled and exception taken.

Ans. Various prices, which were made by the Goodyear Buckle Co. in New York. We followed the complainant down.

Int. 7. Please give the highest and lowest prices obtained for $1\frac{1}{8}$-inch buckles.

Ans. $1.10 and 70.

Int. 8. The larger price was obtained for the earlier buckles made and the smaller price for the later, was it not?

A. Yes.

Int. 9. How many were sold at the larger price?

Ans. I could not tell.

Int. 10. Subject to correction hereafter by the books; state as nearly as you can.

155 Ans. I could not give it; have not looked it up.

Int. 11. What were the maximum and minimum prices of $1\frac{7}{8}$?

Ans. In same proportion, always 5 cents difference, prices 105 and 65.

Int. 12. Maximum and minimum for $\frac{5}{8}$?

Ans. $1 and 60.

Int. 13. The falling prices from the time you began till the lowest price was reached was 40 cents a gross upon each gross of the whole 39,058 gross?

[A.] —.

Int. 14. What was the cost of putting the buckle levers upon the frames?

Same objection as before; overruled, and exception taken.

Ans. I cannot give it.

Int. 15. Subject to correction from the books or other definite sources of information, state as near as you can, gross for gross.

Same objection, ruling, and exception.

Ans. In the neighborhood of $2\frac{1}{2}$ cents per gross.

Int. 16. In declining to give the cost of the buckle frames, do you mean to be understood that you bought them for less than rates at which other manufacturers obtained them—that is to say, special favorable rates?

Ans. I presume we did. We bought for spot cash, while they bought for credit.

Int. 17. Is that all you mean? Is there anything confidential involved in paying spot cash on goods?

Ans. We had the assurance of the manufacturers that we were buying better.

Int. 18. What did you pay the Andrew Terry Co. for frames? I mean what was the price agreed upon when the goods were bought?

Ans. I could not say, it is so long ago.

156 Int. 19. What did the $1\frac{1}{8}$-inch arctic shoe buckles cost you net?

Same objection, ruling, and exception.

Ans. I don't know.

Int. 20. The $\frac{7}{8}$?

Same objection, ruling, and exception.

Ans. I don't know.

Int. 21. The $\frac{5}{8}$?

Ans. Same answer.

Int. 22. What did the $\frac{5}{8}$ in skate buckles cost you net?

Ans. Don't know.

Int. 23. You have stated, have you not, that if the profit on the rest of your business was as good as on these articles you would be satisfied?

Ans. I don't know.

Int. 24. You made a good, handsome profit on them, did you not?

Ans. I don't know.

Int. 25. They cost you considerable less than the minimum price obtained for them, did they not?

Ans. I could not tell.

Int. 26. To what purchasers did you sell the 1⅛-inch shoe buckles?

Ans. To manufacturers of arctic shoes; the ⅞ and ⅝ were sold for other purposes—not all, but some of them.

Int. 27. I find in your statement 24,142 shoe buckles. To whom were the articles in that item sold?

Ans. I have given the names once.

Int. 28. Do you mean that all the purchasers whose names you have given were purchasers of 1⅛-inch buckles?

Ans. No.

Int. 29. Please answer the last question, then.

Ans. L. Candee & Co., Goodyear Rubber Shoe Co., Goodyear Rubber Glove Co., National Rubber Co., Boston Rubber Co., and other small manufacturers I can't think of.

157 Int. 30. Did not yourself nor any one in your establishment ever make an attempt to ascertain the net cost of arctic shoe buckles?

Ans. I presume they did.

Int. 31. Who?

Ans. Myself.

Int. 32. With what results?

Ans. We found it.

Int. 33. Please give it.

Ans. I did not so receive it. I cannot answer it.

Int. 34. Why not?

Ans. It is out of my memory at the present.

Int. 35. Wholly out of your memory?

Ans. Yes, sir.

Int. 36. Can you give no idea?

Ans. No; only that we never sold them at a loss.

Int. 37. When did you forget what they cost?

Ans. I am making hundreds of estimates every month, and can't keep the matters in my mind.

Int. 38. When did you last estimate as to the goods now in question?

Ans. When we proposed to make the last price.

Int. 39. When was that?

Ans. I could not say.

Int. 40. Was it less or more than 50 cents for the larger size?

Ans. I couldn't say.

Int. 41. Was it less or more than 40 cents for the largest size?

Ans. I should say more; I am not positive.

Int. 42. How about the smaller size? Was the cost of that less or more than 40 cents?

Ans. Same answer as the other.

Int. 43. Who were making the kind of shoe buckles mentioned in Exhibit A at the time when Smith & Griggs commenced to use the infringing machine?

158 Ans. The Goodyear Buckle Co. I don't know of any other, positive.

Int. 44. How many buckle levers were ever produced on defendant's machine in one day? I mean the highest number.

Ans. I couldn't say.

Int. 45. Have you ever said that it would produce from 250 to 300 gross in a day?

Ans. I don't recollect that I have.

Int. 46. Would it produce from 250 to 300 gross in a day?

Ans. It never has, on an average.

Int. 47. Give the names of men who have run the machine.

Ans. Hugh Lawton has run the machine. He is the man that has always run the machine and had charge of it.

Int. 48. Has no one else run it or attended it at any time?

Ans. That would be a hard question for me. My superintendent could answer that better than I could.

Int. 49. Has no one run it or attended it except Mr. Lawton, to your knowledge?

Ans. I should not like to state; I don't know.

Int. 50. Did Mr. Lawton have charge of it or attend to it, or both?

Ans. He had charge of it under the direction of my general superintendent, and had a man to help him.

Int. 51. Who was the man to help him?

Ans. He had a man named Maine, I think. I won't be positive.

Int. 53. What did Mr. Maine do?

Ans. My superintendent will have to answer those questions. I could not tell you.

Int. 53. What wages did Mr. Lawton get?

Ans. $4 when he was running the machine. I understood the question.

Int. 54. What else did Mr. Lawton do besides running the machine?

159 Ans. He is tool-maker and machinist. When he was not running the machine he was making tools and machines.

Int. 55. Did he do anything to the machine except to keep it in repair?

Ans. He ran it and saw that the work was made in proper shape, under the direction of our general superintendent.

Int. 56. Did he always feed in the brass strips which the machine transformed into levers?

Ans. That is a question for my superintendent to answer.

Int. 57. Was it Mr. Lawton's business during the whole of the time that you run this machine to personally feed into the machine the brass strips out of which the buckle levers were made?

Ans. I answer that the same as the last question.

Int. 58. Cannot you answer the last question?

Ans. I cannot intelligently.

Int. 59. Cannot you answer the last question but one?

Ans. I make same answer.

Int. 60. When you went to making buckle levers on the infringing machine was there any rival of Mr. Sprague's who was employing the method which you now adopt in making these buckle levers? I mean the alternative method spoken of in your statement.

Ans. Smith & Griggs had made similar goods by the same process that they use for making the lever.

Int. 61. Question repeated.

Ans. I don't know; I don't understand the previous question.

Int. 62. When you went to infringing by using the infringing machine was anybody making buckle levers by the alternate method specified in your statement?

Ans. I don't know.

Int. 63. Mr. Sprague had a patent on the buckle lever itself, which had just expired, had it not?

Ans. Either Mr. Fogg or Mr. Sprague had; I don't know which.

160 Int. 64. When you began to infringe, Mr. Sprague had the entire trade in arctic buckles containing this peculiar lever, did he not?

Ans. I don't know.

Int. 65. Did you see Mr. Sprague's machine at his shop before you went to making these levers?

Ans. Which machine do you mean?

Int. 66. The patented machine?

Ans. No, not that I know of. I saw a machine at his shop some years before. It is said there are two machines, and I do not know which it was, this or the other.

Int. 67. How many buckle levers did you make on this machine after the 31st day of July, 1882, if any?

Ans. Not any; we stopped some time before that.

Int. 68. How many arctic buckle levers have you supplied for the Canadian trade?

Ans. I could not say.

Int. 69. Are any of the firms that you have mentioned as purchasing the 39,058 gross of buckles mentioned in your statement Canadian firms?

Ans. I don't recollect.

Int. 70. What firms in Canada have you supplied?

Ans. Witherall & Co., of Quebec, and Canadian Rubber Company, Montreal; that is all.

Int. 71. Have you sold any to the Quebec Rubber Company?

Ans. I don't know of any such company.

Int. 72. How many have you sold to the Canadian Rubber Company of these arctic shoe buckles during the period covered by your statement?

Ans. I could not say without reference to our books.

Int. 73. Do you know that you have sold several thousand gross?
Ans. I could not say.
Int. 74. How many have you sold Witheral & Co. during the period covered by your statement?
161 Ans. Our sales book will tell; I can't say.
Int. 75. Were there several thousand gross to your knowledge?
Ans. I don't think there was a thousand gross.
Int. 76. Have you sold to any parties whatever in Canada excepting the two you have mentioned?
Ans. Not to my present knowledge.
Int. 77. I understand from your examination that the buckle levers made on the infringing machine which were sold in Canada are not included in Exhibit A; am I right?
A. The statement submitted is a statement of all the buckles sold and of the product of the machine; it includes all made on the infringing machine.
Int. 78. The Canadian buckles were made on the infringing machine, were they not?
Ans. Yes.
Int. 79. Why did you not mention the Canadian firms when you were asked to whom the arctic shoe buckles named in the exhibit were sold?
Ans. We have a great many customers—several hundred—and I mentioned the names that came first to my mind, and included those in the words "other manufacturers."

Counsel for complainant states that he does not care to examine the witness further until he is prepared to answer the questions asked, but that he shall desire to do so when witness has had another opportunity to furnish the information directed by the master.

Cross-examined by Mr. TERRY:

X Int. 80. Who built the machine in question for your company?
Ans. Farrell Foundry & Machine Company of Waterbury, under the direction of our superintendent, Mr. Lines.
X Int. 81. Did either Mr. Lines or the builders of the ma-
162 chine receive any ideas respecting the same from yourself which you had learned or discovered from seeing any machine of Mr. Sprague's?
Ans. I told Mr. Lines, so well as I could recollect, the kind of a machine that I saw at Mr. Sprague's shop in 1874.
X Int. 82. Does the statement prepared and presented by you contain a correct statement of all the levers made on your machine, including sales made to Canadian firms?
Ans. To the best of my knowledge and belief, it does.

CHARLES F. DE FOREST sworn:

Reside in New York; business, merchant; I have charge of the sales of complainant and cashier; the plaintiff's business is carried on under the name of Goodyear Buckle Company.

Int. 83. Were the buckles containing the lever in controversy, that were made on the Sprague machine, sold through you during the whole period covered by defendant's statement?

Ans. Yes.

Int. 84. How many buckle levers of the kind made on the Sprague machine—that is to say, how many buckles containing such levers—were sold during that period?

Ans. A little over 60,000 gross from May, 1880, to July, 1882.

Int. 85. Give the prices which were obtained before the defendant's infringement began for the several sizes mentioned in the statement Exhibit A?

Ans. $\frac{5}{8}$, .80; $\frac{7}{8}$, .90; $1\frac{1}{8}$, 100.

Int. 86. State whether or not these prices could have been maintained but for the infringement of the defendant?

Ans. Undoubtedly they could.

Int. 87. Give the average prices that have been obtained on the several sizes since the infringement down to the end of the time covered by Exhibit A?

Ans. For $\frac{5}{8}$ inch, .65; $\frac{7}{8}$, .70; $1\frac{1}{8}$, .78.

163 Int. 88. Please give the number of each size sold making the 60,000 during the period covered by the statement.

Ans. 10,000 $\frac{5}{8}$s, 10,600 $\frac{7}{8}$s, 40,000 $1\frac{1}{8}$s. This is approximate, very near.

Int. 89. Have you figured the amount of difference from the prices which you said could have been obtained but for the infringement?

Ans. I make a difference of—

15 cents a gross on 10,000 $\frac{5}{8}$s	$1,500
20 cents a gross on 10,000 $\frac{7}{8}$s	2,000
22 cents a gross on 40,000	8,800
Total	$12,300

Int. 90. Have you heard read the testimony of Mr. Smith as to the concerns who have purchased the 39,058 gross mentioned in Exhibit A?

Ans. I have.

Int. 91. State whether or not the concerns mentioned by Mr. Smith were customers of the Goodyear Buckle Co. for the goods in question before the infringement of the defendant?

Ans. Yes, they were; all of them.

Int. 92. State whether or not the Goodyear Buckle Co. would have furnished these concerns but for the infringement of the defendants

Ans. Yes; they would.

Int. 93. To what do you ascribe the reduction in price which you have mentioned as obtained for complainant's goods?

Ans. To the market price being lowered by quotations of a competitor—I mean The Smith & Griggs Manufacturing Company.

Int. 94. Would there have been any necessity for reducing prices, or would they have been reduced but for the fact mentioned in your last answer?

Ans. There would have been no necessity. Most of the
164 customers have told me that they would have used just as many at the other prices, but must buy where they could buy the cheapest.

Int. 95. State whether the demand for these buckles is a comparatively fixed one, and why.

Ans. The arctic shoe manufacture is confined to about a dozen firms, and they are the only parties that use the arctic buckle.

Int. 96. You have spoken of the loss upon the arctic shoe buckles sold by complainant. Do you distinguish at all between the shoe buckle and the lever as a source of profit?

Ans. I do not. The lever I consider the life of the buckle.

Int. 97. Are you familiar with course of business in making these buckles?

Ans. Somewhat; not very thoroughly. I am not an expert as a manufacturer.

Int. 98. Do you know how and in what shape the buckle frame is obtained by the manufacturer?

Ans. I do.

Int. 99. What is it?

Ans. It is delivered, completed and japanned, at so much per pound all ready for the lever to be slipped on.

Int. 100. The buckle frame being thus purchased is there anything more to be done except to make the buckle lever and put it in place on the cross-bar of the frame?

Ans. No; nothing more. Weigh them out and pack them up.

Int. 101. How are the buckle levers put in place?

Ans. Just by the fingers of boys; snapped together; piece-work.

Int. 102. Has any other party infringed upon the patented machine except the defendant?

Ans. Not to my knowledge.

Int. 103. Was anybody making buckle levers of the kind
165 in question by any method when the defendants commenced to use the machine, to your knowledge?

Ans. None to my knowledge.

Int. 104. At that time were any made or sold by anybody outside of the complainant's shop, to your knowledge?

Ans. Not to my knowledge.

Int. 105. State whether at any time during the manufacture by plaintiff and defendant any one attempted to make the buckle lever otherwise than by the patented machine.

A. Yes. Osborn & Cheeseman's agent showed me some that they had made and stopped. He said there was nothing in it—I mean no money in it—for them.

Int. 106. Where is this firm located?

Ans. Ansonia, Conn., I believe.

Int. 107. How did they undertake to make them.

Ans. I don't know that.

Int. 108. So far as you know, did they have all the facilities known to the manufacturers and buckle makers' business, except the Sprague machine?

Ans. So far as I know they had.

Defendant desires to note an exception to all the questions and answers of the witness, on the ground that they are irrelevant and in nowise tend to prove the issues, and desires to have it understood that he waives nothing by cross-examination on the subjects testified about.

Int. 109. State whether or not you distinguished between the profits upon the sales of the buckle or buckle lever and the profits made by running the machine—I mean whether the whole profit on the thing was the profit due to the machine.

Ans. Not altogether. I considered that the machine protected the article and that we got a patent price for it.

Int. 110. Was there any way of making the buckle lever at the time when the Sprague patents were obtained, known
166 to the public generally, which would enable levers to be produced at a less price than that which was obtained for them by complainants?

Ans. None, to my knowledge.

Cross-examined by Mr. TERRY:

X Int. 111. When did you first engage in selling arctic lever buckles manufactured by Mr. Sprague?

Ans. Selling the buckle in its present form, 1877 or 1878. We had sold skate buckles before that.

X Int. 112. Had you not sold an arctic buckle previous to that time?

Ans. I think we had; no doubt we had.

X Int. 113. Was it not a beaded buckle?

Ans. It might have been. I made the distinction about its present form in relation to the machine.

X Int. 114. At what time did you commence to sell arctic lever buckles which were beaded, which were manufactured by Mr. Sprague?

Ans. I cannot precisely say earlier than I have said, because I made the distinction of making by hand. It might have been a year earlier.

X Int. 115. Have you ever sold beaded lever arctic buckles manufactured by Mr. Sprague prior to the time he made the levers on the patented machine?

Ans. I think I have.

X Int. 116. Do you know how the levers in those buckles were made by Mr. Sprague?

Ans. In a general way, I do, by being occasionally in the shops. As I remember, it was a separate machine for beading, the blanks being cut in a press, formed in a machine, and beaded in another.

X Int. 117. There was, then, if I understand you correctly, another known method for manufacturing buckle levers prior to the invention by Mr. Sprague of the patented machine, was there not?
167 Ans. This was Mr. Sprague's invention that I have been speaking of. I meant no other than this invention.

X Int. 118. Question repeated.

Ans. I have already said that we beaded the levers in a separate machine as a part of the process for making buckle levers.

X Int. 119. Question repeated.

Ans. None except, as I have said, in our shop.

X Int. 120. Do you understand that Mr. Sprague invented the process of cutting blanks from a piece of sheet metal by means of a press?

Ans. I do not. I intended to say that his beading of buckle levers was an invention.

X Int. 121. Do you mean to be understood as saying that Mr. Sprague was the inventor of folding pieces of sheet metal into any desired shape by means of a press?

Ans. I do not. I knew that he had a patent for folding a piece of brass back upon itself, as the first patent buckle of that form. This beading was something that came after.

X Int. 122. Do you mean to be understood as saying that Mr. Sprague was the inventor of the method of forming a bead upon a piece of metal by compressing the same between two dies in a press?

Ans. Not at all. This improvement was demanded by the trade, and Mr. Sprague made it to prevent the cutting of the straps.

X Int. 123. The three several methods then employed by Mr. Sprague, to wit, cutting a blank from a piece of sheet metal by means of a power press, the folding of a blank or piece of metal by a power press, and the forming of a bead upon a piece of metal between dies compressing the same in a press, were old and well-known methods prior to the time that Mr. Sprague secured his patent, were they not?

Ans. Not for making buckle levers, so far as I know.

X Int. 124. Were they old and well-known methods for
168 the purpose of performing the several operations specified in the preceding question?

Ans. I do not know; I only know about folding metal in connection with Sprague's patent; I know he folded metal in his first patent—his 1862 patent.

X Int. 125. Do you not know that the method of punching blanks of any desired shape from a sheet of metal by means of a press was old and well known before Mr. Sprague made a lever buckle?

Ans. I suppose it must have been.

X Int. 126. Do you not know that the method of folding pieces of metal in a press was old and well known?

Ans. I think it was old and well known; I know it was.

Question and answer objected to as immaterial in not being limited to the special processes and mechanisms patented to Sprague.

X Int. 127. Do you not know that the method of the forming of beads upon sheet metal by means of compressing the same between dies was old and well known?

Objected to as immaterial.

Ans. I think it must have been old.

X Int. 128. Did not Mr. Sprague employ old and well-known methods in producing buckles prior to his use of the patented machine?

Ans. I suppose so.

X Int. 129. To whom were the 60,000 gross of buckles sold that were sold by you between May, 1880, and August, 1882?

Ans. I have not the account here. I neglected bringing it. I cannot give all the names. The L. Candee & Co.; the Boston Rubber Shoe Co., and Boston Rubber Co.; the Para Shoe Co.; the National Rubber Co.; Brown & Co.; the Fairfield Co.; the New Brunswick Co.; the New York Rubber Shoe Co.; the Hay-
169 ward Rubber Co.; the Goodyear Glove Co.; the Union Rubber Co.; the Rubber Clothing Co.; the Union Hardware Co.; Pope & Stevens; Samuel Winslow; there are probably many others. J. W. Mason; Keystone Rubber Co.; a few to the Goodyear Metallic Co.

X Int. 130. When was it that you saw these buckles made by Osborn & Cheesman?

Ans. I think it was in the autumn of 1880.

X Int. 131. Do you know how many they made of these buckles?

Ans. I do not.

X Int. 132. Do you know of their selling any upon the market?

Ans. I do a few.

X Int. 133. Do you know in what quantity and what prices they obtained for them?

Ans. I can only say what their agent told me.

X Int. 134. Do you not know that they sold them for a less price than you was charging for the same class of goods at that time?

Ans. He quoted to me a price that proved to be double what the agent thought and quoted. I called to see him a second time. The agent said he was mistaken; it was $1.25 a single gross, and afterwards I understood he reduced and closed them out.

X Int. 135. Question repeated.

Ans. I don't know at that time.

X Int. 136. You have testified, if I understand you correctly, that you could have maintained the price upon the several kinds of buckles sold by you that you obtained in May, 1880, down to the present time, except for the infringement of the defendants. Do you mean by that that you could have maintained that price, except that the defendants undersold you in the market?

Ans. I do. I say so because that four or five of our largest customers, on my application for an order, said they would order
170 the goods at the market price. They showed me Smith's prices, and they would not place the order above Smith's quotations, and on my remonstrating with Mr. Smith on these low prices he told me repeatedly, two or three times at least, that the prices were satisfactory to him, and if they made as much money on the rest of the goods as on the buckle he should do well enough.

X Int. 137. Your claim for damages, then, consists in the fact that the defendants sold completed buckles to the trade for less money than you desired to, is it not?

Ans. We lost our trade by reason of his competition; hence the damage in part.

X Int. 138. Question repeated.

Ans. In part, and also reducing our price on what we did sell.

X Int. 139. What claim for damages have you, then, against defendants by reason of their having used the infringing machine in the manufacture of levers?

Ans. The levers are the buckles—the life of the buckles—which we were selling.

X Int. 140. If the defendant had manufactured levers in any other way than on the infringing machine, and had still sold complainant's buckles for the same prices, would you have not sustained the same damage which you now seek to recover?

Ans. I don't know as we could call it damages in that case.

X Int. 141. You would have lost the same amount of sales, would you not?

Ans. I don't know what we should have done in such a case; we should have saved money other ways.

X Int. 142. You would have been compelled to lower your prices to meet theirs, would you not?

Ans. I don't know. We might have accepted the order to sell it out, or put it together, or do various things, if we had no protection.

X Int. 143. Do you not know that if the defendants had
171 produced a buckle, the lever of which was or was not manufactured on the infringing machine, and had sold them in the market at the prices at which they have in fact sold them, that the result to you would have been the same in both instances?

Ans. I do not know what we should have done had there been no patented buckle lever, I am sure.

X Int. 144. Question repeated.

Ans. I don't see that it makes any difference.

Adjourned to October 17, 10 a. m.

HARTFORD, *October* 17, 1882.

Accounting continued.

Parties represented as heretofore.

Defendants lay in evidence a copy of letter from Goodyear Buckle Co. to Smith & Griggs Manufacturing Co., dated August 11, 1880, marked Defendants' Exhibit B.

Also letter from defendants, dated August 14, to complainant, under name of Charles Goodyear & Co., marked Exhibit C.

HUGH LAWTON sworn:

Int. 145. For whom do you work and how long have you been employed for them?

Ans. Smith & Griggs Manufacturing Co.; three years.

Int. 146. Do you know how they have been accustomed to make arctic buckle levers during that period down to the present time?

Ans. I do.

Int. 147. How are they making beaded buckle levers at the present time?

Ans. A blank is cut and drawn upon a press and formed up on a foot press.

Int. 148. Do you mean that in the first operation the blank is cut from the strip and bent into U-shape?

Ans. I do.

172 Int. 149. Is the first step of the first operation the production in the press of the blank marked Sprague Flat Blank on the exhibit marked "Complainant's Exhibit Flat Blank?"

Ans. It is.

Int. 150. Is the blank then bent in the same press into the shape shown in Complainant's Sprague U-shaped Blank?

Ans. It is bent into U-shape, but a little different form.

Int. 151. Do the U-shaped blanks then fall from the machine into a box or other receptacle?

Ans. They do.

Int. 152. These U-shaped blanks are then taken, and in a foot press made into the shape shown in the Exhibit "Sprague Completed Lever," are they not?

Ans. They are.

Int. 153. Please describe the foot press by which the U-shaped blanks are changed into the completed lever.

Ans. We have a pair of tools; we shove the U-shaped blank under an arbor with the fingers, and we kick the foot press, and that forms the whole business.

Int. 154. See if the article now handed you shows the shape of the operative part of the arbor?

Ans. It does.

(Article shown witness marked "Defendant's Exhibit D.")

Int. 155. Does this arbor or mandrel, "Defendant's Exhibit D," control the inner face of the completed lever, with the exception of that part which is pinched together to form the bit?

Ans. Yes.

Int. 156. Which of the two dies that stand one above and the other below the arbor is fixed?

Ans. The bottom die.

Int. 157. And the upper die is movable?

Ans. It is.

Int. 158. How is the mandrel held between the two dies?

Ans. By a hinge.

173 Int. 159. Is there any spring?

Ans. Yes.

Int. 160. Does this spring tend to press the mandrel in the direction of one of the dies; and, if so, which?

Ans. The upper.

Int. 161. Is one of the dies shaped the converse of one of the sides of the completed blank?

Ans. It is.

Int. 162 Is the other die shaped the converse of the opposite of the completed lever?

Ans. It is.

Int. 163. How is the blank, when on the mandrel, kept from a wrong position breadthwise of the mandrel?

Ans. By a set edge.

Int. 164. Describe this set edge.

Ans. I can illustrate it on paper.

The witness illustrates the set edge by a diagram, which complainant's counsel marks Exhibit E, and witness states that *a* represents the lower die and *b* the set edge.

Int. 165. What controls the position of the opposite edge of the blank before and during the action of the dies?

Ans. The upper die.

Int. 166. Please make a sketch of the upper die upon paper substantially the same scale as Exhibit E, showing, among other things, the part that controls the edge of the blank.

Ans. Here it is. The point *d* controls the edge of the blank.

Witness makes an illustration on paper, which is marked Exhibit F.

Int. 167. Please make a sketch showing in position the upper and lower die, and the mandrel and hinge and spring as they stand when the operator is about to insert the U-shaped blank.

174 Ans. Here it is: *a b c d* represent same parts as in last two exhibits. E is the mandrel, *f* the spring, *g* the hinge.

Witness makes and presents a sketch, which is marked Complainant's Exhibit G.

Int. 168. Is the machine which was in use prior to the injunction still kept in working order?

Ans. For making buckles?

Int. 169. Yes.

Ans. It is not.

Int. 170. What has become of it?

Ans. Some parts have been used for some other work, and other parts thrown in the scrap.

Int. 171. Is the part which formally was used to punch out the blank and push the blank down so as to form the U-shape still used for that purpose?

Ans. It is.

Int. 172. Have the old dies been taken out and used in the machine for pressing the U-shaped blank upon the mandrel?

Ans. They have not.

Int. 173. The mandrel and the punching dies are of substantially the same shape, so far as their operative faces are concerned, as those were which were used for the same purpose in the enjoined machine, are they not?

Ans. They are.

Int. 174. How many buckle levers have you ever made in a day upon the machine enjoined—I mean the largest amount?

Ans. About 150 gross.

Int. 175. Have you never made 200 gross?

Ans. Not to my knowledge; no, sir.
Int. 176. Is it your business to count them?
Ans. No, sir.
Int. 177. Whose business was it?
Ans. We never did count them; not from the machine.
175 Int. 178. Do you know how many revolutions the main or crank shaft of the machine made in a minute when moving at its usual and normal speed?
Ans. I do not.
Int. 179. Did you know the number of revolutions per minute of any of the shafts between it and the source of power?
Ans. I do not.
Int. 180. What made you give 150 gross per day as the highest?
Ans. It was the highest I ever cut.
Int. 181. In how many hours was that done?
Ans. Ten hours.
Int. 182. Did the machine run constantly during that time?
Ans. Well, not all the while; it never did.
Int. 183. Whose business was it to count the blanks and know how many were produced?
Ans. Nobody for that business; the machine was run by the day.
Int. 184. Whose business was it to push the brass strips into the machine?
Ans. A man—a helper.
Int. 185. Give this man's name.
Ans. His last name is Maine.
Int. 186. What is his other name?
Ans. I don't know his other name.
Int. 187. Does he work still for Smith & Griggs?
Ans. He does.
Int. 188. What doing?
Ans. A little of everything—a common hand around the shop.
Int. 189. Do you know what wages he gets?
Ans. I do not.
Int. 190. Do you know what he got when his business was to feed strips into the buckle-lever machine?
176 Ans. I do not.
Int. 191. It was your business, I suppose, as tool-maker and machinist, to keep the machine in repair, was it?
Ans. It was.
Int. 192. State also the whole range of your duties as tool-maker and machinist.
Ans. Well, I have charge of the tool department at the present time.
Int. 193. I am now speaking of the time when Maine run in the strips.
Ans. I had charge of the machine and made tools.
Int. 194. What tools was it your business to make?
Ans. The tools for the machine.
Int. 195. What other tools?
Ans. If I got a chance, most anything.

Int. 196. What other machines did you have under your charge?

Ans. Not any at that time.

Int. 197. Does the main shaft of the press as now used for making the U-blanks turn any more times a minute than it did in the old form before it was enjoined?

Ans. It does not.

Int. 198. It still needs and has an attendant to feed in the strips, I suppose.

Ans. It has a boy to put the strips in and start the press, and then he goes off and leaves it.

Int. 199. He has to put in another strip, does he not, when that one is cut?

Ans. He does.

Int. 200. How long are the strips?

Ans. I don't know.

Int. 201. As near as you can tell?

Ans. Some are ten feet and some are five feet; come in that way.

Int. 202. How long does it take to cut up a five or ten foot strip in the machine?

177 Ans. I don't know. I never timed it.

Int. 203. A five-foot strip would be cut in less than a minute, wouldn't it?

Ans. I could not say.

Int. 204. Could you say whether that boy would have to come back with reasonable celerity?

Ans. It would not make any difference if he did not come back, the machines would keep running if he didn't.

Int. 205. How many U-shaped blanks does the attendant of the foot-press punch per hour?

Ans. Eight or nine gross.

Int. 206. Who does the work?

Ans. Girls.

Int. 207. What one?

Ans. I don't know her name.

Int. 208. Do you know her wages?

Ans. A cent and a quarter a gross.

Int. 209. How do you know that the girl can do eight or nine gross from hour to hour?

Ans. By the foreman of the room.

Int. 210. Do you know to your own knowledge?

Ans. I do not.

Cross-examined by Mr. TERRY:

X Int. 211. In running the enjoined machine did it not require an attendant constantly?

Ans. It did.

X Int. 212. Did it not also in addition require your attendance for a considerable part of the time; and, if so, how much?

Ans. Well, about two-thirds of the time I was there.

X Int. 213. Then I understand you that it required a helper all

the time, and your attention two-thirds of the time to operate the machine?

Ans. It did.

X Int. 214. In operating the present press for forming the
178 U-shaped blanks, what proportion of the time does it need the attendance of a helper?

Ans. It requires him about half of the time.

X Int. 215. Can this attendant be, and is he not, employed at other work during the time that he is not needed to attend upon the machine?

Ans. He is.

X Int. 216. What proportion, if any, of your time is needed in operating the new machine?

Ans. About a half an hour in three days.

X Int. 217. Is, or is not, the method of cutting a blank from a strip of metal and bending it into any desired form in the same machine an old and well-known method?

Ans. It is.

X Int. 218. Is not the method of forming beads or other configurations, by means of compressing the same between dies around a mandrel, an old and well-known method?

Ans. It is.

X Int. 219. Were not both of the methods mentioned in the two preceding questions and answers old and well known prior to the year 1880?

Ans. They were.

X Int. 220. In the arrangement of the dies in the foot press, for the purpose of forming the completed lever, is the mandrel pressed or held by the spring against either of the pair of dies?

Ans. It is not.

X Int. 221. What distance does the upper die travel in performing its functions?

Ans. Two or three inches; I would not be positive.

X Int. 222. How far is the mandrel raised from the face of the lower die by means of the spring?

Ans. In the neighborhood of an eighth of an inch.

X Int. 223. When the U-shaped blank is pushed upon the mandrel with the fingers of the operator, and before the upper die
179 descends, does the upper side of the U-shaped blank touch or rest upon the upper die?

Ans. It does not.

X Int. 224. After the blank has been placed upon the mandrel, does the spring operate in any way to press the mandrel and the blank upon it down upon the lower die?

Ans. It does not.

X Int. 225. When the upper die descends in the foot press, what part of the shaping of the finished lever takes place first and what part last?

Ans. It goes down alike. It shapes both top and bottom at the same time.

X Int. 226. Which edge do the dies begin to bend first—the edge where the bit is or the other edge?

Ans. It bends them all over at once.

X Int. 227. Suppose the upper die is brought down until an indentation is made at some place and then the motion of the die is stopped, where would that indentation be?

Ans. It would be on what you call the bit.

X Int. 228. And the bit and the part that encircles the cross-piece would be both partially completed before the beads between the slots?

[A.] ——

X Int. 229. In the foot press as represented in Exhibit G, what prevents the mandrel from ascending higher than it does under the action of the spring?

Ans. A pin inserted under the hinge.

Witness sketches the pin and marks it *h* on Exhibit G.

X Int. 230. When the mandrel *c* is at the highest point and the U-shaped blank is upon the mandrel, what prevents the U-shaped blank from slipping in the direction of the hinge of the mandrel?

Ans. A small bead in the lower die until the upper die comes down.

X Int. 231. Did you ever, prior to the use of the enjoined
180 machine, have any knowledge of any way of making arctic buckle levers which involved the use of a double-beaded mandrel and a pair of dies that punched partly upon the mandrel and partly beyond the edge of the mandrel as is done now by defendant's and was done in the infringing machine?

Ans. Not in the arctic buckles; only in this same machine. I call it the combination machine; I mean the infringing machine.

X Int. 232. Did you ever have knowledge before May, 1880, of dies for producing a blank with slots upon opposite edges, with reference to subsequently bending that blank into its U-shape and afterwards forming it upon a mandrel, so as to make a bit upon one edge and a rounded face for strap upon the other edge, and a seat for the cross-bar intermediate upon the same?

Ans. Only on this infringing machine.

Redirect by Mr. MITCHELL:

R. D. Int. 233. Had you any knowledge of the manufacture of arctic shoe buckles prior to defendant's manufacturing the same?

Ans. No.

R. D. Int. 234. Will you look at exhibit marked "Completed Buckle Lever" and say whether, it having been shown to any mechanic of ordinary intelligence, they would not at once have known that it might be produced in the same manner that it is now made by the defendants?

Objected to as involving issues already passed upon by the court; admitted, and exception taken.

Ans. They would.

R. D. Int. 235. Do you mean that it would not have required any experiment whatever to have made it a practical thing?

Ans. I do.

181 Mr. SMITH recalled:

Int. 236. Mr. Sprague informed me that in making 1⅛-inch levers, the brass employed, after deducting the scrap, costs 20 cents per gross. Is that substantially correct?

Ans. I should think it was not.

Int. 237. Is the cost more than the amount named?

Ans. To the best of my judgment, yes.

Int. 238. Is it more than a cent more?

Ans. I can't say without reference to our books.

Int. 239. Has it been more than twenty cents during the time covered by the infringement?

Ans. I don't know.

Objected to, subject to the same exception.

Mr. SPRAGUE sworn:

Int. 240. Give the items of costs of arctic lever buckles, such as are made on plaintiff's and defendant's machines during the period of infringement, giving first the 1⅛, then the ⅞, then the ⅝?

Ans. I pay twenty cents per pound for brass; the tongue, after it is completed, weighs 15 ounces per gross; there is little over ⅛ waste, which makes 2½ oz. scrap on a gross. Deducting what I get for the scrap leaves the cost of the lever 20 cents per gross for material. It costs 1 cent a gross to cut and form. I pay 1½ cents a gross for putting them on to the frame and into boxes, piecework. The frames average about 20 oz. to the gross; cost, delivered on the dock in New York, 16 cents per pound. The aggregate cost is 42½ cents a gross into gross boxes, not including boxes, which cost $22 a thousand. The brass costs 17 cents per gross for the ⅞; cutting and forming, 1 cent, putting together all amounts to 35½ cents, exclusive of the boxes. The ⅝ costs about 32 cents a gross, everything included.

Int. 241. As the defendant made those during the infringe-
182 ment, was there any difference between the cost of his buckle and the cost of your buckles, size for size, to the best of your knowledge, information, and belief?

Ans. I don't know why they should; I don't think they would cost me any more.

Int. 242. What prices has the defendant obtained for his buckles as compared with the prices obtained by the complainant for his buckles, to the best of your knowledge, information, and belief?

Ans. I have no knowledge—only hearsay; I suppose it to be about the same.

Int. 243. State whether or not you had facilities for supplying the entire market demand for the buckles in question during the period of infringement.

Ans. As far as the levers — I always have had, so far as I know.

Int. 244. Was there any difficulties in getting buckle frames to go with them?

Ans. Once there was; not generally.

Int. 245. State whether the firms given by the defendants as their purchasers were customers of yours before the infringement.

Ans. They all were except one.

Int. 246. Give the name.

Ans. It was the Quebec Co.

Int. 247. Could you, and would you, have supplied the customers but for the infringement?

Ans. I think I would, as we had always done it before.

Int. 248. Was there any way of making these buckle levers other than the one practiced at your shop?

Ans. Not that I know of.

Int. 249. Could they have been made in any other way than your way, so that the buckles would have paid any profit at all at the prices at which they were sold by plaintiff and defendant?

Ans. I don't really know whether I could know that; I did not know of any other way.

183 Int. 250. Is there any practical way that you know of for producing these buckle levers without infringing your patent?

Ans. Not the way I look at my patent; I don't think there is.

Int. 251. Have you heard the testimony of Mr. Lawton as to the way in which the defendants now produce buckle levers by producing the U-shaped blank in one machine, and further shaping them by a mandrel and dies in another machine?

Ans. I did.

Int. 252. From your experience as a manufacturer of buckle levers, what advantage would there be in making them in the way in which they were making them before enjoined and the way testified to as the present method; I mean what difference in the cost per gross?

Ans. I never saw their machine, and therefore don't know what it would cost on that to make them.

Int. 253. What difference would there be between the cost of production on your own machine and the cost on the way now practiced by the defendants?

Ans. I should think some 10 cents or 12 cents. It may not be quite as high as that; I could not tell. I could see the machine in favor of my machine; that or my machine would do it so much less.

Int. 254. As you understand your invention and patent, state whether or not the way of making buckle levers, as practiced by defendants since the injunction as testified to by Mr. Lawton, is within your patent.

Ans. I think it is.

Int. 255. Please give some of the claims which you understand to cover the method now adopted by the defendants; give the number of claims that you understand are still infringed.

Ans. I think it infringes claim 5, patent 231,199; also claims

184 Nos. 1, 2, and 3 of the same patent. (Counsel for defendant

gives notice that he claims that the 4th claim of said patent is infringed). I think also claim No. 5, in patent No. 228,136; also claim 3 of same patent.

Int. 256. You gave as the difference in cost between making buckle levers on your complete machine and defendants' present way as 10 or 12 cents per gross. Would there be substantially the same difference between defendants' present way and the way formerly practiced by them on the infringing machine?

Ans. From information I should think not. I don't know their machine.

Int. 257. Can you give no statement as to what the difference would be?

Ans. I don't think I could.

Int. 258. Give an approximate statement as nearly as you can.

Ans. Between their first machine, as I have heard it described, nearly as much as mine.

Int. 259. Was any other person or company manufacturing buckles containing the buckle lever in question than yourself when defendants began to use the enjoined machine?

Ans. Not that I know of.

Int. 260. Do you remember the defendant Smith being at your factory on a certain occasion?

Ans. I think I do.

Int. 261. State whether it was after or before 1874.

Ans. I think it was after. It was about that time; not far from it.

Cross-examined by Mr. TERRY:

X Int. 262. Was not the time that you refer to when Mr. Smith was at your factory before the time he was in the employ of the defendants?

Ans. I don't know. I do not know when he was in the company.

X Int. 263. Was he not in the employ of the Manhattan Brass Co. at the time referred to by you?

185 Ans. He so represented, as I understand it, as agent, or so on?

X Int. 264. Was not his business there to sell your brass?

Ans. That was what he said.

X Int. 265. What size or gauge of metal do you use for levers?

Ans. It is nearly 26. No. 26, Holmes, Booth & Hayden say on their bill.

X Int. 266. From May, 1880, until August 1, 1882, had brass remained at the same price?

Ans. It had advanced 2 cents. I got it for 18 cents a part of the time.

X Int. 267. Upon what basis, and what items enter into the computation, when you say that it costs you a cent a gross to cut and form levers in your machine?

Ans. The cost of the labor of the man running the machine. I put a man on and run the machine a week, and made 1,720 gross. I paid the man $2.50 per day, and he done some other work besides

that, too; and adding 20 per cent. for running factory would be $18, but I don't think it would be that much.

X Int. 268. Do you know what power it requires to run your machine? If so, please designate by the number of horse power required.

Ans. The man I hire of says I use about a horse power.

X Int. 269. Do you know what it costs to produce power as designated one-horse power.

Ans. I do not.

X Int. 270. In what shape do you receive your buckle frames for which you say you pay 16 cents per pound?

Ans. Boxes, 150 pounds, all completed, and japanned ready to be put on.

X Int. 271. Does it cost the same for putting the levers onto the frames of the $\frac{5}{8}$ and $\frac{7}{8}$?

Ans. Just the same done by piece-work.

186 X Int. 272. Do the paper boxes for each of the several sizes cost the same?

Ans. No, sir; the $\frac{5}{8}$ and $\frac{7}{8}$, $20 per thousand; the others, $22.

X Int. 273. What does it cost you to sell your goods in market?

Ans. Twenty-five cents a hundred gross.

X Int. 274. Do you employ no one to manage, effect, or take charge of the sales of your goods?

Ans. No, sir—that is, for pay.

X Int. 275. Have you any knowledge of what it costs the defendants to produce levers on the infringing machine?

Ans. No more than I have stated.

X Int. 276. Is the statement you have made respecting the same based upon any actual knowledge or only a supposition?

Ans. What statement have you reference to?

X Int. 277. The statement you referred to in your last answer.

Ans. That, from information I received, *that* is my judgment.

X Int. 278. Have you any knowledge as to what it now costs the defendants to produce buckle levers?

Ans. No, sir; any more than what similar work that I have done what it costs.

X Int. 279. I understand you as saying that at the time of making your patented machine there was no other known method of producing buckle levers. Am I right?

Ans. Except what I have done.

X Int. 280. What have you done?

Objected to as immaterial. Admitted and excepted to.

Ans. It is a long story. I had experimented a good many times before I got up the machine, and I have never seen anybody else make one.

187 X Int. 281. Did you not for a long time prior to the completion of your patented machine manufacture buckle levers upon separate machines?

Ans. Yes, sir; I did on two machines; one to cut and bend, striking the bead after the work was done.

X Int. 282. What operation was performed in producing levers on the first of these two machines that you have mentioned?

Ans. I cut the blank and slots, formed it in the U-shape, and pressed it without the bead—pressed the middle bead and bit.

X Int. 283. What was the operation done on the second of the two machines to the lever after it had been operated on by the first machine?

Ans. To put the tail bead on when I could do it; that was what it was made for.

X Int. 284. In the second machine referred to was the partially completed lever placed upon a mandrel when operated upon by this machine; and, if so, was it automatically or by hand?

Ans. Automatically; they went through a spout or raceway dropped on a mandrel and then were carried along automatically till they were struck.

X Int. 285. In what way were they placed in this spout or raceway?

Ans. By the hand.

X Int. 286. In such a way as to be in a proper position when they arrived at the foot of the spout to straddle the mandrel, were they not?

Ans. Yes, sir.

X Int. 287. When did you begin using these two machines that you have just described?

Ans. I don't remember the date; it was just before I built my patent machine.

X Int. 288. Earlier than 1874?

Ans. I don't know; I think about that time.

188 X Int. 289. Before or after the commencement of the year 1874?

Ans. I don't know; it was some time before I finished the other machine—just before the order was given to Bliss & Williams.

X Int. 290. Did I understand you correctly as saying that it costs the defendants 10 or 12 — per gross more to produce buckle levers on the infringing machine than it did on your patented machine?

Ans. I did not understand it so. I had reference to your present hand machine, as you call it.

X Int. 291. Upon what do you base your estimate as to the costs to them by their present method?

Ans. The amount of labor that there would be to do it in that way.

X Int. 292. Have you made any careful computation as to the costs of them by their press method?

Ans. No more—only what it would cost me to do it by doing similar work that I had done.

X Int. 293. To what similar work do you refer?

Ans. Drawing up fasteners for stair rods. You have to pick up and put into the machine and pick out, and the quantity you turn out in a day.

X Int. 294. Have you a sample of those fasteners with you? If not, please describe their shape and method of construction.

Ans. I have no sample here; I have them at home. There was a flat piece of metal; blanks were punched out of the required size; I put it under the foot press between dies and formed it, then struck it, and then picked it out of the die by hand.

X Int. 295. And it is upon the cost to you for producing this kind of work that you have made your estimates as to the cost to the defendants for producing levers by their present process, is it not?

Ans. Yes, sir.

X Int. 296. And the result of that estimate is that it
189 costs the defendants 10 or 12 cents per gross more to produce levers by their present processes than it does you on your patented machine, does it not?

Ans. Yes, sir; I said as near as I could tell till I could see your processes—as near as I could judge.

Redirect by Mr. MITCHELL:

R. D. Int. 297. You have spoken of a way of making buckle levers by two machines, or processes, formerly practiced by you. In that old method were both pairs of beads struck on a single mandrel as in your patented machine, and in defendants' enjoined machine, and in defendants' present method?

Ans. No, sir; they were not.

R. D. Int. 298. In that old method were there any U-shaped blanks that were held in position by two stops, while companion dies produced both pairs of beads upon a single mandrel, as in the patented machine, and in the enjoined machine, and in defendants' present method?

Defendants' solicitor objects to the question as assuming that by defendants' present methods there are two stops which hold the lever in proper position while being acted on by two dies, which fact has nowhere appeared.

Complainant's solicitor refers to the testimony of the witness Lawton.

Admitted, and exception taken.

Ans. No.

R. D. Int. 299. Was that method which you tried of making the beads on the edges in a separate machine successful?

Ans. No, sir; bothered me so much that I gave it up.

R. D. Int. 300. So far as you know, did any manufacturer of buckle levers ever know of this trial of yours until the defendants learned of it by your testimony in this case?

Ans. No, sir.

R. D. Int. 301. Did the public generally, aside from manufacturers, know of it.

190 Ans. No, sir; but very few knew of it.

R. D. Int. 302. Do you know of any one knowing of that attempt except the workmen immediately employed and those immediately interested in it?

Ans. I do not. Mr. Goodyear and Mr. DeForrest knew of it and my workmen.

R. D. Int. 303. Did you ever know of the methods described by Mr. Lawton being employed at your shop or anywhere else before you made your patented invention?

Ans. No, sir.

Recross-examined by Mr. TERRY:

R. X Int. 304. At the time when you were using these two machines you had a patent lever covering buckles, did you not?

Ans. Yes, sir.

R. X Int. 305. Was any special effort made by you to prevent people who visited your factory from seeing the two machines?

Ans. None; only when I would think there was a man who was in the buckle business, a stranger, till I knew him.

R. X Int. 306. Did not Mr. Smith when he visited your factory in 1874 for the purpose of selling brass see both of these machines in operation?

Ans. I think not.

HARTFORD, *Nov.* 8, 1882.

Accounting continued.

Parties present as heretofore. Defendant files amended return marked "Exhibit Amended Return."

191 In the Circuit Court of the United States for the District of Connecticut.

LEONARD A. SPRAGUE *v.* THE SMITH & GRIGGS M'F'G CO.

The defendant hereby makes return of the number of buckles the levers of which were made on the infringing machine and sold by them between May 25th, 1880, and Aug. 1, 1882, hereby amending the return heretofore made as being incorrect in that it did not include foreign sales, they being inadvertently omitted by their bookkeeper.

The statement is hereto annexed, and shows not only the number so made and sold, but the parties to whom sold, and the number sold to each, together with the dates of such sale, and the price obtained therefor.

They further make return under protest, believing it is not a proper matter of enquiry in ascertaining "the gains, profits, and advantages which the defendant has received or which have arisen to *him* since the 25th day of May, 1880, as well as all damages in excess of profits sustained by the complainant from infringing

192 the said exclusive rights of said complainant by the manufacture or use of the said letters patent," as ordered in the decree in this case, to enquire into the cost of making buckles (a portion of which only was produced on said machine), or the prices obtained therefor, but that the enquiry should be confined to ascertaining the profits derived by the defendants in manufacturing buckle levers only upon the infringing machine, which profits are, and only are, the saving of the defendants by the use of the in-

fringing machine in the cost of producing levers, as said levers are not patented, nor have they ever been sold by the defendants separately, so that the defendants have derived no profits, except what might have been saved to them in the cost of producing.

Said further return is of the cost of manufacturing buckles, the levers of which were made on the infringing machine.

For the $1\frac{1}{8}$-in. buckles the cost of brass was 20c. per lb.
Levers weighed $1\frac{5}{16}$ lbs. per gro.
Scrap " $\frac{4}{16}$ " "

Cost of material per gro.	$.22\frac{3}{4}$
Frames weighed $1\frac{8}{16}$ lb. p'r gro.	
" cost, per lb. 18c.	
Frames, per gro., cost	.27
Dip — lacquer	.02
	$.51\frac{3}{4}$
193 Am't for'd	$.51\frac{3}{4}$
Labor on same:	
Blanking & forming	$.02\frac{1}{3}$
Setting	.02
Rounding	.02
Closing	$\frac{3}{4}$
Packing, &c.	.01
	$.08\frac{1}{2}$
	$.59\frac{5}{6}$
Add 25 per c.	.15
	$.74\frac{5}{6}$

For $\frac{7}{8}$-in. buckles:
Frames weighed $1\frac{1}{16}$ p'r gro.

Cost, per gro., @ 18	$.19\frac{1}{8}$
Levers $14\frac{1}{8} \div 16$, @ 20.	
Scrap, $2\frac{1}{8} \div 16$, @ 14.	
Cost, per gro.	.15
Dip & lacquer	.02
	$.36\frac{1}{8}$
Labor, as before	$.08\frac{1}{2}$
	$.44\frac{5}{8}$
Add 25 p'r c.	$.11\frac{3}{20}$
	$.55\frac{3}{4}$

For $\frac{5}{8}$-in. buckles:

Frames weigh 1 lb.	.18
Levers, $13\frac{3}{8} \div 16$, @ 20.	
Scrap, $1\frac{7}{8} \div 16$, @ 14.	
194 Am't for'd	.18
Cost levers, per gro., natural	.$13\frac{3}{4}$
Dip & lacquer	.02
	.$33\frac{3}{4}$
Labor, as before	.$08\frac{1}{2}$
	.$42\frac{1}{4}$
Add 25 p'r c.	.$10\frac{1}{2}$
	.$52\frac{3}{4}$

All of which is submitted under protest.
Waterbury, Nov. 7, 1882.

THE SMITH & GRIGGS M'F'G CO.,
EDW'D S. SMITH, *Treas.*

Subscribed & sworn to before me this 8th day of November, A. D. 1882.

E. E. MARVIN,
U. S. Com'r.

195 *The Goodyear N. R. Shoe Co.*

1880.	$1\frac{1}{8}$ in.	$\frac{7}{8}$ in.	$\frac{5}{8}$ in.			
June 1	50			Gro. arctic shoe buckles, @	70	35 00
		16		"	60	9 60
" 7	50			"	70	35 00
		16		"	60	9 60
" 14	50			"	75	35 00
		16		"	60	9 60
" 16	100			"	70	70 00
" 21	50			"	70	35 00
		16		"	60	9 60
" 28	50			"	70	35 00
		16		"	60	9 60
Sept. 14	50			"	70	35 00
		16		"	60	9 60
Oct. 2	1,000			"	70	700 00
		500		"	60	300 00
Nov. 23		100		"	60	60 00
Dec. 20		70		"	60	42 00
" 24	156			"	70	109 20
" 29	74			"	70	51 80
1881.						
Jan'y 6		50		"	60	30 00
" 8	44			"	70	30 80
" 10	112			"	70	78 40
		50		"	60	30 00
" 13	50			"	70	35 00
		50		"	60	30 00
" 17	50			"	70	35 00
" 19	50			"	70	35 00

" 22	54			"	70	37 80
" 24	100			"	70	70 00
		100		"	60	60 00
" 26	100			"	70	70 00
Feb'y 7	24			"	70	16 80
		50		"	60	30 00
" 8	74			"	70	51 80
		100		"	60	60 00
" 10	164			"	70	114 80
" 12	132			"	72	92 40
	2,584	1,166				2,508 40

196

	1¼.	⅝.	⅜.			
Bro't forward	2,584	1,166				2,508 40
Feb'y 24	148			Gro. arctic shoe buckles, @	70	103 60
25		100		"	60	60 00
March 9	200			"	70	140 00
" 17	78			"	70	54 60
		100		"	60	60 00
" 28	100			"	70	70 00
		100		"	60	60 00
" 30	400			"	70	280 00
		100		"	60	60 00
			100	"	60	60 00
May 10		100		"	60	60 00
" 25			26	"	60	15 60
June 4	40			"	70	28 00
" 1	34			"	70	23 80
		100		"	60	60 00
June 7	128			"	70	89 60
		100		"	60	60 00
June 13	200			"	70	140 00
" 22		100		"	60	60 00
" 23			50	"	60	30 00
" 25	500			"	70	350 00
		200		"	60	120 00
July 14			50	"	60	30 00
Aug't 10	500			"	70	350 00
Sept. 2		72		"	60	43 20
" 13	20			"	70	14 00
		68		"	60	40 80
" 14	34			"	70	23 80
" 16	50			"	70	35 00
" 20	100			"	70	70 00
" 22	122			"	70	85 40
		60		"	60	36 00
" 30		200		"	60	120 00
Oct. 4	172			"	70	120 40
" 12	400			"	70	280 00
" 14		100		"	60	60 00
			50	"	60	30 00
" 25			34	"	60	20 40
" 28	500			"	70	350 00
			66	"	60	39 60
Nov. 1		100		"	60	60 00
" 12		200		"	60	120 00
" 26	400			"	70	280 00
Dec. 5		200		"	60	120 00
" 20	500			"	70	350 00
		180		"	60	108 00
	7,210	3,346	376			7,280 20

197

Bro't forward	7,210	3,346	376			7,280 20
1882.						
Jan'y 24	40			Arctic shoe buckles, @	70	28 00
		34		"	60	20 40
" 26	172			"	70	120 40
" 31	200			"	70	140 00
		200		"	60	120 00
Feb'y 17	400			"	70	280 00
March 20	400			"	70	280 00
		200		"	60	120 00
April 25	500			"	70	350 00
May 9		200		"	60	120 00
" 22			50	"	60	30 00
" 23	500			"	70	350 00
June 12		298		"	60	178 80
" 17	200			"	70	140 00
July 1	248			"	70	173 60
" 19	30			"	70	21 00
" "		200		"	60	120 00
	9,900	4,478	426			9,872 40

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1880.	1¼ in.	⅞ in.	⅝ in.			
June 2	26			Gro. arctic shoe buckles, @	75	19 50
" "		10		"	65	6 50
" 10	26			"	75	19 50
" "		16		"	65	10 40
" "			10	"	65	6 50
" 24	26			"	75	19 50
" "		10		"	70	7 00
" "			10	"	65	6 50
July 21	26			"	75	19 50
Aug't 4	26			"	75	19 50
" "		10		"	70	7 00
" "			6	"	65	3 90
" 19	26			"	75	19 50
" "		6		"	70	4 20
" "			8	"	65	5 20
" 30	26			"	75	19 50
" "		16		"	70	11 20
Sept. 14	12			"	75	9 00
" "			6	"	65	3 90
" 16	26			"	75	19 50
" "		16		"	70	11 20
" "			6	"	65	3 90
1882.						
Feb'y 7	26			"	75	19 50
" 18	10			"	75	7 50
" "		6		"	70	4 20
" "			4	"	65	2 60
March 15	16			"	75	12 00
" 25	2½			"	75	1 88
" 26			2½	"	65	1 63
April 8			6	"	65	3 90
" 9	15			"	75	9 00
" 26	16			"	75	12 00
" "		10		"	70	7 00
May 25			26	"	65	16 90
1882.						
June 16		10		"	65	6 50
" 21		10		"	65	6 50
	302½	120	84½			363 51

199 *The Canadian Rubber Co.*

1880.	1⅛ in.	⅞ in.	⅝ in.			
May 27	430			Gro. arctic shoe buckles, @	75	322 50
Oct. 11	250			"	75	187 50
Nov. 26	250			"	75	187 50
Dec. 2	50			"	75	37 50
13	280			"	75	210 00
1881.						
Jan'y 13	182			"	75	136 50
Feb'y 11	200			"	75	150 00
" 28	338			"	75	253 50
July 2	252			"	75	189 00
" 12	250			"	75	187 50
" 18		50		"	70	35 00
" —			26	"	65	16 90
Sept. 5	468			"	75	351 00
" —		26		"	70	18 20
Oct. 1	32			"	75	24 00
		74		"	70	51 80
Nov. 1	600			"	75	450 00
		100		"	70	70 00
Dec. 13	500			"	75	375 00
1882.						
Feb'y 16	600			"	75	450 00
June 27	198			"	75	148 50
		30		"	70	21 00
July 15	260			"	75	195 00
			30	"	65	19 50
	5,140	280	56			4,087 40

200 *National Rubber Co.*

1880.	1⅛.	⅞.	⅝.			
Oct. 27	20			Gro. arctic shoe buckles, @	75	15 00
" 28	120			"	75	90 00
Nov. 27	100			"	75	75 00
Dec. 14	100			"	75	75 00
" "		100		"	70	70 00
" 18	28			"	75	21 00
" "		100		"	70	70 00
" 27	72			"	75	54 00
1881.						
May 31	200			"	75	150 00
June 15	200			"	75	150 00
July 25			20	"	65	13 00
Nov. 1	24			"	75	18 00
" 10	276			"	75	207 00
" 11	50			"	75	37 50
	1,190	200	20			1,045 50

American Rubber Co.

1880.	1⅛.	⅞.	⅝.			
July 19	76			Gro. arctic shoe buckles, @	75	57 00
Aug't 21			26	"	60	15 60
Sept. 28	100			"	75	75 00
1881.						
Jan'y 17			50	"	60	30 00
April 9	100			"	75	75 00
Aug't 23	100			"	75	75 00
" "			26	"	65	16 90
Oct. 20	200			"	75	150 00
1882.						
Feb'y 15	100			"	75	75 00
			30	"	65	19 50
	676		132			589 00

201 *L. Candee & Co.*

1880	1¼ in.	⅞ in.	⅝ in.				
Aug't 18	350			Gro. arctic shoe buckles,	@	70	245 00
" "		100	50	"		65	97 50
" "				"		60	
Oct. 4	250			"		70	175 00
" "		150		"		65	97 50
" "			50	"		60	30 00
Nov. 30	114			"		70	79 80
" "		150		"		65	97 50
Dec. 15	250			"		70	175 00
1881.							
Jan'y 11	120			"		70	84 00
Feb'y 1	114			"		70	79 80
" 3	184			"		70	128 80
" 19	84			"		70	58 80
" 21	100			"		70	70 00
" 25	216			"		70	151 20
March 12	602			"		70	421 40
" "		250		"		65	162 50
" "			50	"		60	30 00
" 25	400			"		70	280 00
April 22	500			"		70	350 00
May 31	152			"		70	106 40
June 9	348			"		70	243 60
" 28	346			"		70	242 20
July 8	454			"		70	317 80
Aug't 17		500		"		65	325 00
" "			50	"		60	30 00
" 30	510			"		70	357 00
" "			100	"		60	60 00
Sept. 3		100		"		65	65 00
Oct. 18	300			"		70	210 00
" "		200		"		65	130 00
" "			100	"		60	60 00
Nov. 14	150			"		70	105 00
" "		400		"		65	260 00
" "			22	"		60	13 20
" 15	204			"		70	142 80
" 23	246			"		70	172 20
" "			22	"		60	13 20
	5,994	1,850	444				5,667 20

202 1881	1⅛.	⅞.	⅝.				
Bro't forward	5,994	1,850	444	"			5,667 20
Nov. 30			80	Gro. arctic shoe buckles,		60	48 00
Dec. 1			76	"		60	45 60
1882.							
Jan'y 6	600			"		70	420 00
" "		200		"		65	130 00
" "			200	"		60	120 00
May 1	858			"		70	600 60
" "		500		"		65	325 00
" "			300	"		60	180 00
" 6	342			"		70	239 40
	7,794	2,550	1,100				7,775 80

203 *Boston Rubber Shoe Co.*

	1880.	1½.	⅞.	⅝.				
Nov.	26	200			Gro. ar-tic shoe buckles,	@	75	150 00
Dec.	11		200		"		70	140 00
	1881.							
Jan'y	12	50			"		75	37 50
"	14	100			"		75	75 00
"	19	90			"		75	67 50
June	18	200			"		70	140 00
"	"		100		"		65	65 00
"	"			100	"		60	60 00
July	14	500			"		70	350 00
"	21		288		"		65	187 20
Aug't	29	500			"		70	350 00
"	"		72		"		65	46 80
Sept.	3		140		"		65	91 00
"	20	248			"		70	173 60
"	"		58		"		65	37 70
"	"			50	"		60	30 00
"	22	52			"		70	36 40
"			42		"		65	27 30
Oct.	5		286		"		65	185 90
"	8	452			"		70	316 40
"	21	348			"		70	243 60
"			128		"		65	83 20
"	27			50	"		60	30 00
Dec.	16	300			"		70	210 00
	1882.							
Jan'y	14	396			"		70	277 20
"	26	104			"		70	72 80
Feb'y	27	300			"		70	210 00
March	7	100			"		70	70 00
"	21	300			"		70	210 00
"	"		206		"		65	133 90
	1880.							
June	5		200		"		70	140 00
"	"			50	"		65	32 50
		4,240	1,720	250				4,280 50

204 *North and Judd M'f'g Co.*

	1881.	1½.	⅞.	⅝.				
March	5	100			Gro. arctic shoe buckles,	@	70	70 00
"	"			100	"		60	60 00
"	21			300	"		60	180 00
June	4	200			"		70	140 00
Dec.	6			5	"		65	3 25
	1882.							
Feb'y	18			100	"		70	70 00
		300		505				523 25

North American Rubber Co.

	1881.	1½.	⅞.	⅝.				
March	29	100			Gro. arctic shoe buckles,	@	75	75 00
"	"		10		"		70	7 00
Nov.	26	142			"		75	106 50
		242	10					188 50

205 *Samuel Winslow.*

1881.									
May	18.	88	gro.	$\frac{5}{8}$-in.	arctic	shoe	buckles,	@	60	52 80
Dec.	3.	50	"	"	No. 2	skate	"		80	40 00
"	15.	50	"	"	2	"	"		80	40 00
		188								132 80

W. A. Sutton.

1881.									
April	2.	50	gro.	$\frac{5}{8}$-in.	arctic	shoe	buckles,	@	65	32 50
July	14.	102	"	"	No. 2	skate	"		85	86 70
		152								119 20

Pope and Stevens.

1881.									
May	20.	100	gro.	$\frac{5}{8}$-in.	No. 2	skate	buckles,	@	85	85 00
June	16.	56	"	"	2	"	"		85	47 60
"	18.	94	"	"	2	"	"		85	79 90
"	29.	150	"	"	2	"	"		85	127 50
Aug't	10.	100	"	"	2	"	"		85	85 00
"	30.	100	"	"	2	"	"		80	80 00
1882.									
Jan'y	6.	100	"	"	2	"	"		80	80 00
March	21.	154	"	"	2	"	"		80	123 20
"	30.	150	"	"	2	"	"		80	120 00
April	4.	188	"	"	2	"	"		80	150 40
June	10.	200	"	"	2	"	"		80	160 00
		1,392								1,138 60

J. W. Mason.

1881.									
Sept.	1.	50	gro.	$\frac{5}{8}$-in.	No. 2	skate	buckles,	@	80	40 00
1882.									
April	15.	50	"	"	2	"	"		80	40 00
		100								80 00

206 *The Union Hardware Co.*

188–.									
July	21.	100	gro.	$\frac{5}{8}$-in.	No. 2	skate	buckles,	@	85	85 00
Aug't	5.	200	"	"	2	"	"		85	170 00
Sept.	20.	100	"	"	2	"	"		80	80 00
Nov.	11.	100	"	"	2	"	"		80	80 00
Dec.	23.	100	"	"	2	"	"		80	80 00
"	29.	62	"	"	2	"	"		80	49 60
"	31.	148	"	"	2	"	"		80	118 40
1882.									
March	11.	110	"	"	2	"	"		80	88 00
"	14.	90	"	"	2	"	"		80	72 00
"	18.	68	"	"	2	"	"		80	54 40
"	23.	132	"	"	2	"	"		80	105 60
April	6.	100	"	"	2	"	"		80	80 00
May	13.	100	"	"	2	"	"		80	80 00
		1,410								1,143 00
March	20.	158	"	$\frac{5}{8}$-in.	No. 2	skate	buckles returned,	@	80	126 40
		1,252								1,016 60

J. W. Wayne.

1881.									
Nov.	7.	5	gro.	$\frac{5}{8}$-in.	No. 2	skate	buckles,	@	80	4 00

207 *Recapitulation.*

	1⅛.	⅞.	⅝.
Goodyear N. R. Shoe Co	9,900	4,478	426
Canadian Rubber Co	5,140	280	56
Goodyear I. R. Glove M'f'g Co	302½	120	84½
L. Candee & Co	7,794	2,550	1,100
National Rubber Co	1,190	200	20
American " "	676	----	132
Boston Rubber Shoe Co	4,240	1,720	250
North American Rubber Co	242	10	
North & Judd M'f'g Co	300	----	505
Samuel Winslow	----	----	188
Wm. A. Sutton	----	----	152
Pope & Stevens	----	----	1,392
Jas. W. Mason	----	----	100
Union Hardware Co	----	----	1,252
J. W. Wayne	----	----	5
	29,784½	9,358	5,662½

1⅛ in.	29,784½ gross.
⅞ "	9,358
⅝ "	5,662½
Total	44,850 gro.

208 EDWARD S. SMITH recalled.

Examined by Mr. MITCHELL:

Int. 307. I understand by your amended return that you admit the manufacture of 44,805 gross of the buckles whose levers were made upon the infringing machine instead of the number heretofore reported.

A. I do.

209 Int. 308. Did the brass that went into the levers cost 20 cents per pound at all times during the period covered by the infringement?

Ans. It did not; that was as fair [an] average as I could take from my purchasers during the time in question.

Int. 309. What was the lowest price?

Ans. 18 cents.

Int. 310. During what proportion of the time was it 18 cents?

Ans. As near as I can recollect, a fifth.

Int. 311. During what portion was it 20 cents?

Ans. Half the time.

Int. 312. Who did the weighing of the brass which enabled you to report the number of pounds consumed per gross?

Ans. I did, and had them verified by Mr. Roberts. We took two different weights and compared them.

Int. 313. How did you do the weighing?

Ans. We took a pound of metal and weighed the product in finished levers and the scrap?

Int. 314. What was the gauge of the metal?

Ans. No. 25, Brown & Sharp's gauge.

Int. 315. How much did the levers weigh that were produced by a pound of metal?

Ans. I have no memorandum with me to show it.

Int. 316. Can you give the number of levers per pound of sheet metal?

Ans. I cannot.

Int. 317. Did you cut the blank from a strip which was of the same width as the blank pressed from it?

Ans. We did.

Int. 318. Have you used any different thickness of sheet metal than No. 25, Brown & Sharp's gauge, in making 1⅛-inch buckle levers?

Ans. We have not.

Int. 319. Have you never bought frames at less than 18
210 cents per pound?

Ans. Not for 1⅛-inch buckles, except a few that we bought from A. Terry & Co. that we could not use, and those were bought and used up before the date of the patent, May 25, 1880.

Int. 320. How many gross did you lacquer at a single dip?

Ans. In the neighborhood of 5 gross, more or less, as the boy put them in the basket.

Int. 321. How do you reach the conclusion that the lacquering was 2 cents per gross?

Ans. By taking accurate weight of the acid, alcohol, lacquer, and the time used in doing it.

Int. 322. You have an item here for blanking and forming of 2⅓ cents per gross. What is that for, and how is that sum reached?

Ans. It is reached by taking accurate time of a week's work of of the machine in question and the cost of labor in attendance upon the machine.

Int. 323. How much of the 2⅓ cents is for cost of labor on the machine?

Ans. All except 5 per cent.

Int. 324. Give the price per day [of] all the other items that enable you to know that the blanking and forming cost 2⅓ cents per gross.

Objected to, as all that matter has been gone into and has been inquired of of the same witness fully, and fully shown in detail in the first statement.

Ans. I refer to Exhibit A as fully answering this question.

Int. 325. How did you reach the item of 2 cents per gross for setting?

Ans. All our work is done by the piece, and that is what we pay our employees for that work.

Int. 326. Have you always paid that amount?

Ans. We have; in the beginning we paid ¼ cent more.

211 Int. 327. What is the operation called rounding?

Ans. Show me the exhibit and I will show you.

Int. 328. Have you always paid for that by the piece?

Ans. We have. We place the levers on a mandrel and round the two inside edges of the slot where the lever is attached to the shoe to prevent cutting.

Int. 329. Have you always paid the price named in your statement of 2 cents for rounding?

Ans. We have always paid that, or more.

Int. 330. Is the statement contained in the Exhibit Amended Statement of the Cost of Making Buckles copied from any of the estimates which have been made from time to time for use in the factory?

Ans. It is not.

Int. 331. Will you produce, for the inspection of the master, the estimates of costs which have been made from time to time for the guidance of the company?

Objected to as assuming that there are such estimates now in existence that can be produced.

Ans. I will if I can find them. When we make a new estimate on any article we generally tear up former ones. We only keep on file the last estimate made.

Int. 332. Did you consult any such estimate in preparing the statement?

Ans. I did not.

Int. 333. Are any of such estimates in existence, as far as you know?

Ans. I do not know of any.

Counsel for complainant calls upon the witness and defendant's counsel to produce any such estimates as may be in existence.

Int. 334. I see that the cost of $1\frac{1}{8}$-inch buckles, as given in your statement, is $74\frac{5}{6}$ cents per gross, and that the larger portion
212 of the buckles of that size were sold at 70 cents per gross. Do you mean to be understood as swearing that the defendant company lost $4\frac{5}{6}$ cents on every gross of $1\frac{1}{8}$ buckles?

Ans. I have sworn that our statement is correct, and if it had been necessary we should have lost 50 per cent. rather than have been driven out of the trade by the Goodyear Buckle Company.

Int. 335. Do you swear now that your company lost $4\frac{5}{6}$ cents on every gross of $1\frac{1}{8}$ buckles that they sold at 70 cents per gross?

Ans. My answer is the same as before.

Int. 336. Did you ever make an estimate of the cost of $1\frac{1}{8}$-in. buckles for the guidance of the company in which the cost was figured at $74\frac{5}{6}$ cents per gross?

Ans. I don't recollect what my former estimates were.

Int. 337. Did you ever, to the best of your recollection and belief, make such an estimate as is called for in the last question, to wit, $74\frac{5}{6}$ per gross?

Ans. Somewhere in that neighborhood.

Int. 338. Will you swear that you ever made an estimate for the guidance of the company in which the cost of $1\frac{1}{8}$-inch buckles was put higher than 65 cents per gross?

Ans. I will.

Int. 339. How high will you swear that you made these estimates?

Ans. Over 70 cents.

Int. 340. How high do you estimate the cost of ⅞-inch buckles for the guidance of the company?

Ans. The amended statement will show.

Int. 341. Did you take the statement in the amended statement relating to ⅞-inch buckles from the company estimates?

Ans. I did not.

Int. 342. At how high a figure will you now swear you estimated the cost of ⅞-inch buckles in the estimates which you made for the guidance of the company?

213 Ans. I have furnished estimates of the cost of these buckles, and sworn to the same, which I stand ready to have verified by any manufacturer in Waterbury.

Answer objected to as irresponsive.

Witness adds: I do not remember former estimates.

Int. 343. Explain what you mean by your statement a little while ago that you would have made the buckle at a loss of 50 per cent. rather than to have been driven from the market by the Goodyear Buckle Company.

Ans. We consider their methods of doing business unfair, and are not in the habit of being driven out of the trade by threats, and when our competitors make lower prices we stand prepared to meet them. We considered also that this suit was brought for them to keep the monopoly of this line of goods, which they had already enjoyed seventeen years by virtue of a former patent.

Int. 344. Why did you single out the Goodyear Buckle Company as special antagonists in this matter?

Ans. By their conduct toward our customers while I was spending a few months in Europe.

Int. 345. Did you have to put down the price to keep them from keeping the business.

Ans. We did not; we only met their price. They represented to our customers during my absence from home that we had given up the manufacture of those goods after a promise from their treasurer and my instructing our people that matters were adjusted in regard to price, and to take no steps to change the price of these goods in any manner while I was away. The promise their treasurer gave me was that we each should ask fixed prices for these goods and let the trade go where it naturally would, both houses having customers who would at the same price buy goods of each house.

Int. 346. What customers did you have who were your customers before they were the customers of the Goodyear Buckle Co.—I mean what customers as long ago as the time when you went to Europe?

214 Ans. The Goodyear Metallic Rubber Shoe Co., the Canadian Rubber Co., and the North American Rubber Co. and the Goodyear Glove Co.

Int. 347. Do you know that each of the three parties whose names you have given bought arctic buckles of your company before they bought such buckles manufactured by Sprague?

Ans. I do.

Int. 348. How do you know in the case of the Goodyear Metallic Rubber Shoe Co.?

Ans. We have made their goods exclusively for twenty years. When the Sprague patent on this particular buckle expired Mr. G. A. Lewis, the treasurer of said company, in conversation with myself, expressed a desire to use this particular buckle. In accordance with his desire I made them for him, and afterwards showed them to Mr. Francis Cowles, the managing man of both the rubber companies in Canada, who also adopted them in place of what he had hitherto bought of our company.

Int. 349. Do you mean to be understood as saying that if you had not sold the buckles at the prices for which you sold them they would have been sold by the Goodyear Buckle Company, and you would have lost the trade?

Ans. If we had not sold these buckles to these parties we should have sold something else, as we had already engaged their trade for a number of years, and Osborn & Cheeseman about that time brought out precisely the same buckle as the one in question, and were offering it to the same trade.

Int. 350. You said something to the effect that you would have sold these buckles at a loss of 50 per cent. rather than have the Goodyear Buckle Company take away your trade in them. Do you mean that they stood ready to take away your trade, and would have done so if you had not met them in prices?

Ans. Either they or Osborn & Cheesman Company.

215 Int. 351. Did Osborn & Cheesman ever make buckles to any extent?

Ans. I don't know how many. I know they sold L. Candee & Co., of New Haven, a large shipment at one time.

Int. 352. Practically the business of making and selling these buckle levers has been controlled by yourselves and the complainant, has it not?

Ans. Up to the expiration of L. A. Sprague's patent of May 25, 1862; yes.

Int. 353. Did you make any before the expiration of the L. A. Sprague patent of 1862?

Ans. No.

Int. 354. Since you began to make arctic buckle levers has not the business of making them and selling them been practically controlled by the complainant and yourselves?

Objected to as not designating the kind of arctic buckle levers referred to by the question or confining it to the particular kind of lever in controversy.

Complainant's counsel states that he refers to the buckle in controversy.

Ans. By Osborn & Cheesman, the Goodyear Buckle Company, and ourselves.

Int. 355. Did Osborn & Cheesman ever sell 2,000 gross, to your knowledge?

Ans. I think he did.

Int. 356. Do you know they did?

Ans. I have no positive knowledge of any one else's business except my own.

Cross-examined by Mr. TERRY:

X Int. 357. When Osborn & Cheesman commenced the manufacture of these buckles, did they not offer them in the market to the trade?

Ans. They did.

216 X Int. 358. When the prices for buckles was reduced from time to time, was it not because your customers informed you that the Goodyear Buckle Company had offered them at a price less than what you had previously obtained?

Ans. It was.

X Int. 359. So, then, you met their prices. Is that what I understand you to mean when you say you would have sold them at a loss of 50 per cent. rather than to have been driven out of the market?

Ans. It is. We made a better buckle than they did, with an improvement of a rounded end to attach the strap to and packed in better form, and the buckle trade gave us the preference at the same price; furthermore, we carried a stock of these goods and were able to fill our orders promptly.

Adjourned to November 14, 10 a. m.

217 *Defendants' Testimony.*

United States Circuit Court, District of Connecticut. In Equity.

LEONARD A. SPRAGUE

vs.

SMITH & GRIGGS MANUFACTURING COMPANY.

WATERBURY, *Jan.* 11, 1883.

EARL A. SMITH sworn and examined by Mr. TERRY:

My business has been in mechanical pursuits all my life since I was 21 years old. I have been familiar with the manufacture of small articles, notions, and the like from metals.

Int. 1. If in May, 1880, had the buckle known as the Sprague buckle, one of which I now show you, been brought to you to be manufactured, by what well-known method could you have constructed that part called the lever of the buckle?

Ans. There are two well-known methods, one about as good
218 as the other. First by cutting the blank from sheet metal and drawing it into U-shape this could be done in one operation, then forming it into proper shape on a former or mandrel in a press. The second way or plan would be to stamp the blank after it was cut out into such a shape that when it is folded together in the middle, which can be done by one operation in a press, it will be ready to attach to the buckle.

Int. 2. Were or not the methods which you have just described old and well-known methods prior to May, 1880?

Ans. They were for the manufacture of such goods as required such methods.

Int. 3. Would it have required any invention to have adapted either of the methods described by you to the manufacture of buckle levers such as are contained in the Sprague buckle?

Ans. It would not.

Int. 4. In the second method described by you, how many operations would it have required to have cut the blank from sheet metal and stamped the same into the required configuration ready for folding into the finished lever?

Ans. It could be done by one operation. By one operation I mean the operation of one machine.

Int. 5. Have you, and can you produce, any illustrations of either of the methods mentioned by you as being old and well known?

Ans. Yes; both of them.

Int. 6. Please do so, and describe the operation of either.

Ans. I herewith produce two illustrations of the first-described method, which are marked "Defendant's Exhibits E. A. Smith No. 1 and No. 1 A." The two articles were made in the factory of the Waterbury Buckle Company; were cut out by a press formed into U-shape as mentioned in first method, then formed into proper shape by tools I now produce. The former mentioned placed in evidence and marked "Defendant's Exhibit E. A. Smith No. 2."

219 Int 6. Please describe the operation of the former just exhibited by you—that is, after the blanks are bent up; how do they put on these, etc.?

Ans. The blanks, after being drawn in U-shape, are placed upon the hinged piece called the former by hand. This piece is so constructed as to hold the blank in proper position, and the punch in the side of the press then comes down and presses the blank between it and the lower die. A pin or stop on the lower die prevents the blank from slipping in that direction, the shape of the former keeping it from slipping in other directions. The stop or pin on the lower die is adjusted to make the bit part the proper length.

Int. 7. Have you any recollection or means of stating when the former marked "E. A. Smith No. 2" was made and put in operation in your factory?

Ans. In October or November, 1877.

Int. 8. State whether the former, which you have shown, marked "Defendant's Exhibit E. A. Smith No. 2," was or not prior to October, 1877, a well-known method for forming articles of that character.

A. It was.

Int. 9. Have you and can you produce the former or tools used in the manufacture of articles like "Defendants' Exhibit No. 1 A?"

Ans. I can, and herewith produce it.

Defendants place in evidence the former produced, which is marked "Defendants' Exhibit E. A. Smith No. 3."

Int. 10. Please describe the operation of the former just exhibited by you.

Ans. This article which I now produce is as manufactured by the Waterbury Buckle Company. The blank for it, after being cut, was drawn into U-shape, as shown in defendants' — as here shown, then placed by hand on a hinged piece called the former or mandrel of
"Defendants' Exhibit E. A. Smith No. 3," the pin on the
220 lower die and the shape of the former itself holding it in
place. The punch in the slide of the press then comes down and forms the metal between it and the lower die.

The defendants place in evidence the article produced in last answer, which is marked "Defendants' Exhibit E. A. Smith No. 4."

Int. 11. Can you produce any examples of the second method described by you?

Ans. I can, and do herewith produce one.

Defendants place in evidence the article produced, which is marked "Defendants' Exhibit E. A. Smith No. 5."

Int. 12. Have you and can you produce the tools upon which the article just produced by you, marked "Exhibit E. A. Smith No. 5," was made?

Ans. I have, and do produce the tools referred to.

Defendants place in evidence the tools produced, which are marked "Defendants' Exhibit E. A. Smith No. 6" and "Defendants' Exhibit E. A. Smith No. 7."

Int. 13. Please describe the method of forming the articles upon the tools last produced by you.

Ans. The blank, after being cut, is placed by hand upon the die marked "Exhibit No. 6." The punch comes down and forms it as mentioned in answer to Int. 6. In describing the second operation for the second plan or second method the partially formed blank is then placed on the former, marked "Defendants' Exhibit E. A. Smith No. 7." A suitable punch comes down and completes the process.

Int. 14. Could or not the cutting out of the blank and forming the same on the tool, marked "Defendants' Exhibit No. 6," have been done on the same machine at one operation, and whether or not such devices as these were well known?

221 Ans. It could have been done in one operation and on one machine, and such method was old and well known.

Int. 15. Can you tell us what the cost, by the gross, of producing the article marked "Defendant's Exhibit E. A. Smith No. 1 A," exclusive of the cost of metal, was when manufactured upon the tools shown by you, marked "Defendant's Exhibit E. A. Smith No. 3?"

Objected to as immaterial and admitted, and exception taken.

Ans. I cannot give you the price we actually paid; it is a matter of judgment. I think it would cost about 1¼ cents per gross for the

operation of forming it into U-shape, that in this case having been done by a separate operation from forming the blank. To complete the operation by forming it on the former would cost 2½ cents per gross.

Int. 16. How many, in your judgment, of these articles have you manufactured?

Ans. Several hundred gross. They are not manufactured in very large quantities; not over 500 gross probably.

Int. 17. Please state, if you can, the cost of manufacturing articles, exclusive of material, like "Defendant's Exhibit E. A. Smith No. 1" on the tools shown by you marked "Defendant's Exhibit No. 2."

Ans. The cutting and forming into U-shape would not cost to exceed ½ cent per gross. The forming and finishing on mandrel would not cost to exceed 1¼ per gross.

Int. 18. State what, in your judgment, the lever of the Sprague buckle would cost to manufacture, exclusive of the cost of material, as compared with the two exhibits marked "Defendant's Exhibits No. 1 and No. 1 A."

Ans. To cut and draw the Sprague lever into U-shape would not cost any more per gross than the same operation on "Defendant's Exhibit No. 1," to wit, ½ cent per gross, to finish it on the former; might cost from ⅛ of to ¼ of a cent per gross more than same
222 operation on "Defendant's Exhibit E. A. Smith No. 1," or from 1⅜ cents to 1½ per gross.

Int. 19. How long ago was it that you commenced to use tools marked "Defendant's Exhibit E. A. Smith No. 3?"

Ans. In December, 1879, or early in January, 1880.

Cross-examined by Mr. MITCHELL:

X Int. 20. Have you ever made buckle levers like those in controversy?

Ans. I have not.

X Int. 21. Have you ever known them made by anybody in the second method spoken of by you, to wit, by bending after giving them substantial shaping?

Ans. I have never made buckle levers made in that way.

X Int. 22. What is the object of the rectangular hole in "Exhibit E. A. Smith No. 1?"

Ans. To attach it to the article that it is designed to be attached to.

X Int. 22½. Was that hole cut before or after the article had been subjected to the action of "Defendant's Exhibit E. A. Smith No. 2?"

Ans. That rectangular hole was cut after; it could have been cut before easily if it had been required.

X Int. 23. Do you understand it was cut after because the correspondence of the edges could be most perfectly secured in that way?

Ans. I do not understand that that was the object.

X Int. 24. So far as you know, in producing "Defendant's Ex-

hibit E. A. Smith No. 1," has it been customary, in making them, to cut the rectangular hole in both walls together instead of cutting them before they were bent up?

Ans. It has.

X Int. 25. In striking "Defendant's Exhibit E. A. Smith No. 5" is the metal at any point drawn in both directions from a beaded portion, as in shaping the buckle levers in controversy?

Ans. It is not drawn to form a round bead, as on the lever
223 in controversy, but there is no difficulty in forming one or more such beads if required.

X Int. 26. Is there any such bead in "Defendant's Exhibit E. A. Smith No. 1?"

Ans. There is a slight bead in the bit.

X Int. 27. Is there a bead in "Defendant's Exhibit E. A. Smith No. 1" which is bounded on the sides by flat metal, as in the buckle lever in controversy?

Ans. There is not.

X Int. 28. In any of the Exhibits "E. A. Smith No. 1," "E. A. Smith No. 1 A," "E. A. Smith No. 4," "E. A. Smith No. 5," is there a bead which is immediately adjacent to an elongated slot, as in the buckle lever in controversy?

Ans. There is not.

X Int. 29. Is there any tool before the master which you recognize as a device for producing the buckle lever in controversy?

Ans. I see on the table a tool evidently designed for that purpose.

Complainant's counsel asks the master to mark the device identified by the witness as "Complainant's Exhibit E. A. Smith No. 8."

X Int. 30. What do you understand to be the office of the elevation upon the edge of the lower forming die nearest to the point of suspension of the mandrel; does it not act as a stop or gauge to limit the lateral movement of the shaped blank while it its being formed?

Ans. It shows no mark upon it of having any such function, but it has dirt upon it, which indicates the metal did not come in contact with any considerable portion of it.

X Int. 31. Do you not understand that the elevation referred to in the last question was designed to perform the function indicated in my last question, namely, to act as a limit to the lateral movement of the blank while the squeezing process was going on?

224 Ans. I do not know what it was designed for, but I do not think it was necessary for that purpose, nor do I think it actually did perform any such function.

X Int. 32. Do you not, as a mechanic, looking at said elevation, understand that it was intended to perform the function limiting the lateral motion of the blank during the operation of stamping?

Ans. I have no means of judging of the intention of the maker of the die beyond what it actually appears to accomplish.

X Int. 33. Do you find any purpose subserved by the elevation in question, excepting preventing the blank, or some portion of it, going too far in that direction?

Ans. Yes.

X Int. 34. If that elevation were not there, might not the blank be put too far on the mandrel by the operator?

Ans. It might, and it might be put too far on the mandrel with the elevation.

X Int. 35. You say that without the elevation it might be put too far on the mandrel; and, with the elevation, it might be put too far on the mandrel. Does not the presence of the elevation diminish the danger very considerably?

Ans. As I have already said that I did not believe the elevation performed any such function as keeping the blank from slipping in that direction, I do not see how it could diminish the danger or likelihood of its slipping.

X Int. 36. Do you think that the elevation in question has no tendency to keep the blank in such position that the beads shall be always parallel with the slot?

Ans. No further than that the elevation is necessary to form the bead.

X Int. 37. But the elevation extends considerably above that portion of its face which acts upon the bead, does it not?

Ans. It does. But I do not believe that portion of the elevation which extends above what is necessary to form the bead performs any necessary function.

225 X Int. 38. Please look at the article which I now show you, consisting of a lower die and a mandrel, and say whether you find a portion corresponding with the elevation to which I have been calling your attention.

Complainant's counsel place in evidence article last shown witness, which is marked "Complainant's Exhibit E. A. Smith No. 9."

Ans. I find such an elevation, or I find an elevation on said article.

X Int. 39. So far as you can judge as a mechanic, were the two elevations designed substantially the same function, whatever that function may have been?

Ans. I see a different function which this last elevation seems to have been designed to perform, to wit, to act as a guide by which the partially formed lever could be slid automatically into its proper place.

X Int. 40. Do you find any indication that the elevation on the article in your hand tended to control the lateral position of the blank in connection with the operation of stamping?

Ans. It may have done so.

X Int. 41. Is it not similarly situated relatively to the co-operating mandrel and the companion die with the corresponding elevation on "Complainant's Exhibit E. A. Smith No. 8?"

Ans. It is, but it is not so high; not materially higher than is-

necessary to form the bead. It bears marks of wear to the top of it, while the other does not.

X Int. 42. So far forth as the one on "Smith No. 8" is the highest, its tendency is the greater to prevent the edge of the blank from jumping over it, is it not?

Ans. Not unless the blank actually touches it where it is higher.

Redirect by Mr. TERRY:

R. D. Int. 43. Please look at "Complainant's Exhibit No.
226 8" and state, if you can, which part of the lever placed between the dies is first engaged by the descending die—the bit or leg of the lever?

Ans. The leg.

R. D. Int. 44. Will you please in said exhibit place a U-shaped blank, so that the leg will rest as high as possible upon the projection in the lower die, and then, either with the upper die or with your finger, compress the leg of such lever at the point where the descending die first engages with it, and witness the effect of such operation upon the other leg of the lever resting upon the lower die and state what effect it thus produced?

Ans. It has the effect of making it recede from the stop and bringing it against the front gauge.

R. D. [Int.] 45. I now place upon the mandrel in said exhibit a U-shaped blank, which has been partially pressed by the two dies, and ask you whether or not the action of the descending die in connection with the mandrel is not such as to prevent the blank from pressing backward against the elevation in the lower die?

Ans. I think it does have that effect.

R. D. Int. 46. Has not the set of tools marked "Defendants' Exhibit E. A. Smith No. 2" stops or elevations for the purpose of preventing lateral motion in the blanks while being compressed between the two dies, and which perform substantially the same functions as the elevations before referred to in "Complainant's Exhibit E. A. Smith No. 8."

Ans. The tools marked "Exhibit E. A. Smith No. 2" have elevations on the former or mandrel which are designed to hold the blank in place while it is being compressed, and also to make it possible to place such blanks in the tools more rapidly than they could otherwise be placed.

R. D. Int. 47. State whether or not the method of forming small articles of metal upon a mandrel between two or more dies was old and well known prior to May, 1880.

Ans. Long before that.

227 R. D. Int. 48. State whether you have known of hand mandrels, or mandrels not attached to any machine, having been used by placing the blank to be formed upon the mandrel and then inserted between two or more dies which compressed the same while the operator still retained hold of the mandrel.

Ans. It is a very common method of forming blanks for various purposes.

Defendants place the blank referred to in R. D. Int. 45 in evidence, which is marked "Defendants' Exhibit E. A. Smith No. 10."

Witness desires to add to his answer to X Int. No. 30 that the elevation referred to may perform the function of enabling the operator to feed the work with the dies with greater rapidity than they could be done without being at all necessary to the making of the perfect lever.

Recross-examined by Mr. MITCHELL:

R. X. Int. 49. In performing the function just stated by you, the elevation acts as a stop, I believe.

Ans. The elevation acts as a stop only in feeding the blank into its proper place.

R. X. Int. 50. If the elevation were not there to act as a stop, the operator might insert the blank so as not to be precisely straight with the mandrel, might he not?

Ans. It is possible that that would be the result.

R. X. Int. 51. In that case the action of the dies might produce a defective lever, might they not?

Ans. That might be the result.

R. X Int. 52. So that action of the stop in preventing the misplacing of the blanks results in the dies finding the blank in proper position to produce a properly formed lever; am I right?

Ans. Yes.

228 R. X Int. 53. Have you any idea that the majority of blanks in the "Exhibit E. A. Smith No. 8" were placed by the operator squarely upon the mandrel before the upper die descended upon the same?

Ans. I don't suppose they were. The stop prevents a slight percentage of imperfect work which might otherwise result from careless operatives.

FERGUS KELLY sworn, and examined by Mr. TERRY:

I reside in Ansonia, town of Derby, Conn.; employed by the Osborne & Cheesman Co. as foreman for seventeen years last past. Their business is manufacturing sheet metal and cutting up metal into all kinds of articles.

Int. 54. State whether at any time your firm engaged in the manufacture of a buckle known as the Sprague buckle.

Ans. They engaged in the making of this shoe buckle known as the Sprague buckle—I could not tell the date—in the neighborhood of four years ago.

Int. 55. Will you please to describe the process by which you formed the lever of the buckle? And if you have any of the implements used in the making of said buckles, please produce them and refer to them in your answers.

Ans. We took the sheet metal, stripped up the right width to make the blank, and fed it in, and struck it into blanks with two slots cut. Afterwards I put it through a foot press and made those two indentations between the slots and the edges at once. I after-

wards put it through another foot press and formed it into a U-shape. Afterwards I put it onto a little hand mandrel and put it between two dies that came down on it and formed it into shape; afterwards snapped it onto the iron frame and pinched it across the point of the lever by dies, and that finished it.

Int. 56. Would there have been any difficulty in forming the indentations or beads between the slots and ends of the lever at the same operation of forming the other bead and the bit of the lever?

229 Ans. I think there would. I do not think you could form it at the same time that you formed it on the mandrel without another operation.

Int. 57. Suppose the mandrel had been formed the same as this (the mandrel shown in "Complainant's Exhibit E. A. Smith No. 9), could not the two beads and bits all have been formed at one operation?

Ans. I think that they could.

Int. 58. State whether the method of forming like articles upon a mandrel was old and well known prior to your using the same in making these buckle levers.

Ans. I should think it was. I have known it as far back as 1856.

Int. 59. Can you give us any estimate of the number of buckles which you made, the levers of which were formed upon this mandrel?

Ans. I don't think we made over 300 or 400 gross, if we did that many; I would not say positively.

Int. 60. Will you please state what it cost you to produce those levers by the method you adopted, exclusive of the cost of the material?

Ans. I should probably get that pretty high on account of our doing as few of them as we have. Our work is all piece-work, and to insure good work I pay a rather extravagant price to start with. I afterwards reduce the price according as the hands get accustomed to the work, so that [to] the price that those cost—they cost us 3½ cents per single gross—we usually add 10 per cent. for power.

Int. 16. I notice in the mandrel produced by you there is a notch or recess. Please explain what is the occasion of that, and for what purpose it was done.

Ans. That notch is to allow a projection in the die to enter against the mandrel to prevent it from crowding back while forming.

Int. 62. Does that projection in the die, when the lever is
230 engaged between the dies, go through the slots already formed in the lever?

Ans. It does.

Int. 63. State whether or not the elevation or projection in the die last spoken of performed the function of a stop for the purpose of assisting the operator in properly placing the lever between the dies, and also to hold the same in proper position when being compressed by the dies.

Ans. It helps the operator in placing them in the die accurately and with more speed. It also holds them parallel with the slot.

Defendants offer in evidence the mandrel referred to by the witness, marked "Defendants' Exhibit F. Kelly No. 11."

Int. 64. State whether these levers could have been made by forming suitable indentations upon the flat blank and then folding the same in the middle, so as to have produced a completed lever?

Ans. I think they can. I thought of making them that way when I first started.

Int. 65. State whether or not that is an old and well-known method of forming such articles.

Ans. It is.

Int. 66. State whether you had previously used that method of making similar articles; and, if so, whether you can produce any such articles?

Ans. Yes, sir; I have. I herewith produce two such articles. Those are cut, then are stamped and beaded, laying flat, and then afterwards folded together, as they now appear.

Defendants place in evidence the exhibits produced, which are marked "Defendants' Exhibit F. Kelly No. 12."

Int. 67. For what, in your judgment, could buckle levers [have] been made for, exclusive of the cost of material, by the process last described by you?

Ans. They might be produced for from 2 to 2½ cents per
231 gross for the labor, to which we would add 10 per cent. on the finished buckle for power, etc.

Defendants place in evidence the four blanks shown by the witness, representing different stages of manufacture at the Osborn & Cheesman Co.'s referred to, which are marked "Defendant's Exhibit F. Kelly No. 13."

Cross-examined by Mr. MITCHELL:

X Int. 68. When you began to make the buckle lever you have testified to were you already aware of the Sprague machine buckle lever?

Ans. I was not.

X Int. 69. Didn't you know that Mr. Sprague or the Goodyear Buckle Company were making buckle levers?

Ans. I did not.

X Int. 70. When did you first know it?

Ans. The first I knew of it was now.

X Int. 71. Did you not know that a New York or Brooklyn concern made such buckles?

Ans. I did not.

X Int. 72. You say that the date was four years ago. May it [not] have been six months or more later than that?

Ans. It might have been; I could not state accurately.

X Int. 73. Did you sell all that you made?

Ans. We did not.

X Int. 74. What became of them?

Ans. We have them in the mill.

X Int. 75. Why did you keep them?

Ans. Could not tell; wasn't anybody out trying to sell them.

X Int. 76. How many salesmen did you have?

Ans. Three.

X Int. 77. Could not your salesmen have disposed of them if they were merchantable?

Ans. They did not seem, they being a new article, to class them with any of their other goods.

232 X. Int. 78. Did you make other buckles?

Ans. Yes, sir.

X. Int. 79. Quite largely?

Ans. Yes, sir.

X. Int. 80. You spent considerable money to prepare to make these buckles, did you not?

Ans. Not very much.

X. Int. 81. Why did not the same motives that prompted to begin the business cause you to keep it up?

Ans. Because we did not seem to get any orders for them—sales, rather—nobody solicited any orders for them.

X. Int. 82. Do you mean that none of your salesmen ever made any effort to sell them?

Ans. Not that I know of.

X. Int. 83. What did you pay for cutting the blank in the largest size?

Ans. We figured a cent a gross; it did not cost that.

X. Int. 84. What for stamping the beads between the slots and the edge?

Ans. A cent a gross.

X. Int. 85. What for bending it into U-shape?

Ans. 1¼ cent or 1⅛ cent; I have forgotten what I paid now.

X. Int. 86. What for forming the sides upon the little hand mandrel between the dies?

Ans. 1¼. cent.

X. Int. 87. Did the price vary at all for the smaller sizes?

Ans. I think we put the same prices on all sizes.

X. Int. 88. Can you say, of your own knowledge, that Osborn & Cheesman would not have continued that business if they could have produced a merchantable buckle at a paying price?

Ans. I could not.

X. Int. 89. In forming the buckle lever upon the hand mandrel the operator had to first adjust the U-shaped blank so that the
233 slots would come opposite the cutaway portion of the mandrel, and then place the mandrel and blank over a projection on the die that nearly fitted the slot, did he not?

Ans. No, sir.

X Int. 90. Explain how he did it.

Ans. On my dies the mandrel is separate from the dies or die bed, leaving an open space between the upper and lower dies whereby

the U-shaped blank can be readily inserted in the lower die; then placing the mandrel in the U-shaped blank, the upper die is brought down and forms them to the required shape. The projection in the lower die comes into the slot of the lower die. There is one in the upper die, also, corresponding to that in the lower. These projections are a little thicker than the thickness of the brass.

X Int. 91. Were the dies excavated to produce the double bead for the cross-bar of the frame?

Ans. They were not.

X Int. 92. The operator had to hold the mandrel against one of the projections in order to produce good work, did he not?

Ans. It came against one of them of its own accord when the die shut together—both of them, probably.

X Int. 93. What produced that result?

Ans. I am rather under the impression—I would not state that it would not make a perfect blank if those projections were not there at all—that it might make a perfect blank without those projections. I never tried it in my life.

X Int. 94. You say in reply to Int. 3 that you think there would be difficulty in forming the edge beads and the other beads at the same operation. Why do you say so?

Ans. On my mandrel it is cut away so that there would be no support to form the outer bead.

X Int. 95. Have you ever known one of these buckle levers in controversy to be made by the same method as the articles in "Exhibit F. Kelly No. 12?"

Ans. I have not.

X Int. 96. It would require five beads or corrugations to
234 be produced on each blank, would it not?

Ans. It would—say four.

X Int. 97. Would it spoil the blank to anneal it for that purpose; I mean for the purpose intended?

Ans. I should say not.

X Int. 98. Do you mean that annealed brass would be just as good as the ordinary brass that is used for this buckle lever?

Ans. It would not be quite as stiff, but I think it would be stiff enough for all purposes.

X Int. 99. You say that you thought of making the blanks by striking them in the flat and then bending them up when you first started. Did you try that method?

Ans. We did not.

X Int. 100. Why not?

Ans. I thought I could get more hands on them the other way and get them out sooner and with less trouble.

Redirect by Mr. TERRY:

R. D. Int. 101. The buckles which Osborn & Cheesman made, of which you have spoken, are of a kind, are they not, which are sold exclusively to parties who do not use the arctic shoe buckle or the Sprague buckle, so called?

A. They are.

R. D. Int. 102. At any time have you, as superintendent of their works, heard any complaint from the proprietors or the salesmen that the arctic shoe buckle which you made was not a well-made buckle or was not merchantable?

Ans. They never have to my knowledge, and I would be pretty apt to know if they did.

R. D. Int. 103. Did they fail to be sold by reason of any defect in their manufacture?

Ans. Not that I know of.

R. D. Int. 104. Was not the reason why they failed of selling simply because no salesman considered them within his line and therefore — made any special effort to sell them.

235 Ans. That was the exact reason I understand.

R. D. Int. 105. Were not some of the buckles that you made sold to L. Candee & Co., New Haven?

Ans. They were.

E. S. SMITH recalled.

Examined by Mr. TERRY:

Int. 106. Will you explain the process of manufacturing levers by your company at the present time, if you have made any changes in that process?

Ans. We have rebuilt our machine, and feed the metal which is slit into strips the right width of the lever required, first punching the holes for the strap, then cutting the lever off to the required length; then the lever is fed into a die which forms all the beads. These levers are afterward taken and drawn into U-shape on a foot press.

Int. 107. When the blank is fed into the die that forms the beads is it then a flat blank?

Ans. It is.

Int. 108. When you say it is afterward bent into U-shape is it or not then a finished blank ready to be put onto the buckle frame?

Ans. It is all ready to use for a buckle.

Int. 109. Can you give an estimate of the cost of producing buckle levers by this process exclusive of the cost of material? If so, please state the figures.

Ans. The machine will produce between 600 and 700 gross per day. Allowing time for delays and repairs it will produce 500 gross perfect levers per day at an expense of $1.50 for attendance. We pay 1 cent per gross for finishing the levers on a foot press ready to apply to the buckle frame. These levers so formed are so much superior in finish and exactness of bead that we are able to dispense with the rounding operation described before in former testimony. This new process is one that was talked over by myself and superintendent before we made the machine in litigation.

236 Cross-examined by Mr. MITCHELL:

X Int. 110. Is it your purpose to patent that machine or any portion of it?

Ans. I consider everything about this machine so old and well known to mechanics in this part of the country that a patent, if granted, would be of no use.

X Int. 111. You think there is nothing patentable in it, do you?

Ans. It is a hard question to answer, and I am not a patent expert.

X Int. 112. The first operation in your rebuilt machine is the same as in the old machine, is it not?

Ans. It is.

X Int. 113. After that I understand you reverse the order of the old machine by stamping the beads and then bending it up instead of bending the blank up and then forming the beads. Is that right?

Ans. It is.

X Int. 114. How long have you run this machine?

Ans. About a month; could not say the exact time. I have produced about 2,000 gross on it, and know it to be a success.

X Int. 115. What is done after the blanks are drawn into the U-shape in the foot press?

Ans. They are snapped onto the iron buckle frame and closed on a press by striking the top part.

X Int. 116. How many beads are struck upon the blank in the flat?

Ans. All of the beads on the lever.

X Int. 117. Are they all struck at the same instant?

Ans. They are.

X Int. 118. Do not the two middle beads begin to be formed before the two end beads?

Ans. They do, of a necessity, because the middle beads are deeper than the outside beads.

237 X Int. 119. Who got up this press in its present form?

Ans. It was built in our machine room after the plans talked over between our different machinists and myself. I could not say that it was the idea of any one particular man, but rather a conclusion arrived at by consultation with all the parties.

X Int. 120. Name the man who built it over.

Ans. Hugh Lawton; and I do not know but what a good many other machinists worked on parts of it; it was Lawton's particular baby.

X Int. 121. Explain the way of bending up the blank in the foot press.

Ans. A flat piece of steel, with proper gauges to hold the blank form in place. The blank is placed into these gauges, and a sharp, knife-like punch comes down and draws it into shape.

X Int. 122. What prevents the beads from catching on the side walls of the matrix when the knife descends?

Ans. It only descends far enough to form the bit.

X Int. 123. What gives the bit its tangential shape relatively to the adjacent bead?

Ans. The dies.

X Int. 124. Do you mean the dies that strike it in the flat?

Ans. Yes.

X Int. 125. You allude to the special form between the two beads?

Ans. Yes.

X Int. 126. And it is that special form in the blank in connection with the subsequent operation that gives the bit the tangential shape referred to?

Ans. Yes.

Mr. KELLY recalled.

Examined by Mr. TERRY:

238 R. D. Int. 127. Since your examination was suspended have you been down to the factory of the defendants and examined the machine upon which they are now making buckle levers?

Ans. I have.

Defendants' solicitor produces a blank marked "Defendants' Exhibit F. Kelly No. 14."

R. D. Int. 128. Please look at "Exhibit 14" and state whether that is a blank made upon that machine, and explain to us how it is made.

Ans. It is. The metal is split up wide enough to make the buckle, coiled up and placed on a reel in front of the machine. The end is entered between two rolls and carried through guides across the forming die. The upper die, coming down, cuts off the metal sufficiently long to make the blank and punch two slots in it. Then a guide works to the right and carries the blank between a pair of forming dies, which give it the required shape—the upper die descending and the lower one remaining stationary. The next blank coming along, striking the one formed, pushes it out of the dies, and it falls into a box. This is all that this machine does to the blank.

R. D. Int. 129. Did you see the method employed by them for finishing the lever that you have just described? If so, please describe how it was done.

Ans. I did. It is simply put on a stationary die in a foot press, with a groove in same die to admit the bit to enter when the ascending punch strikes it, forming the blank into the shape of the one that I now produce.

Defendants offer the blank produced, which is marked "Defendants' Exhibit F. Kelly No. 15."

Recross-examined by Mr. MITCHELL:

R. X Int. 130. Are the two sides of the groove in the lower die which admit the bit of corresponding shape with each other?

239 Ans. I should say not. I think one side of the groove is on a little more angle than the other, and the descending punch shaped to match.

R. X Int. 131. Does the shape of this groove and the shape of the descending punch determine and regulate the shape of the bit of the lever?

Ans. I should say partly. I rather presume that it is given a starter in the first machine from the appearance of it.

R. X Int. 132. State whether or not the method employed in the first-described machine for forming the flat, corrugated blank is an old and well-known method for punching and forming articles made from sheet metal.

A. I should say it was.

R. X Int. 133. Admitting that it is old to impart various shapes to flat metal blanks in dies, do you not see in the peculiar shaping of the blank "Exhibit F. Kelly No. 14," with reference to the subsequent operation of forming the bit, evidence of contrivance?

Ans. Nothing more than would be necessary.

R. X Int. 134. The tangential shaping of the bit is the conjoint result of the special shaping of the blanks between the middle pair of beads and the subsequent operatian, is it not?

Ans. I should say it was.

Adjourned to February 1, 1883, 10 a. m.

240 *Master's Report upon Accounting.*

United States Circuit Court, District of Connecticut. In Equity.

LEONARD A. SPRAGUE

vs.

SMITH & GRIGGS MANUFACTURING COMPANY.

In this case the defendant reports, and the master finds, that the defendant manufactured and sold during the period covered by the accounting herein aretic buckle levers made on the infringing machine of the defendant to the amount of 44,805 gross, as follows, viz:

29,784½ gross 1⅛-inch levers.
9,358 " ⅞ "
5,662½ " ⅝ "

The defendant first protests against any inquiry into the cost of the whole buckle or profits on the whole buckle, as the lever of the buckle only was made on the infringing machine. But I find this a very pronounced case where the part made on the

241 infringing machine—*i. e.*, the levers—was the gist of the whole thing, the desideratum that alone sold the buckle, or, as the complainant's witness says, the "life of the buckle."

But the defendant reports that it made no profits whatever on the manufacture and sale of this amount of goods, and that it did in fact make and dispose of these goods, mainly to the complainant's previous customers, at a loss, and as a reason for this it says, by the declaration of E. S. Smith, treasurer and manager, that it would have made and sold these goods at a loss of 50 cents a gross rather than to be driven from the market by Sprague or the American Buckle Company, whose business ways it did not like.

That the $1\frac{1}{8}$ inch levers cost it $74\frac{5}{6}$ cents per gross.
" $\frac{7}{8}$ " " $55\frac{3}{4}$ "
" $\frac{3}{8}$ " " $52\frac{3}{4}$ "

That therefore this total amount of buckles cost it $30,618.40.

That it received or charged therefor $31,469.86, leaving only $851.26, a very insufficient sum to cover expenses of selling, bad debts, etc.

I cannot find this claim to be honest, and cannot find that the defendant made no profits.

Some light can be gained of the cost of making these buckles from Mr. Sprague's statement of the cost to him of making his buckles of similar sizes on a similar machine.

He proves that the $1\frac{1}{8}$ cost him 56 cents per gross.
" " " " $\frac{7}{8}$ " " 47 " " "
" " " " $\frac{5}{8}$ " " 40 " " "

At these prices he could have made the 44,805 gross made by the defendant on the infringing machine on his machine for $33,322.78, and thereby made a clean profit, even at the defendant's selling prices, of $7,183.60.

The facts that the defendant charged his machinist's wages against this production, making the attempt to enhance costs very apparent that no detail of costs by items is supported by any one hav-
242 ing personal knowledge of the same or by any record or book, and especially the improbability that the defendant would have made these goods at a loss for so long a time to gratify the personal dislikings of one of its officers, in my mind goes far to estab the complainant's figures as the correct ones as to the cost of these buckles; and there are some further inconsistencies of evidence that will be touched upon further along in the report that have had their effect in discrediting the defendant's evidence generally in this case.

And if the complainant is by law entitled to recover all the profits that the defendant made on these buckle levers that it made on the complainant's patented machine, then I find that he is entitled to recover of the defendants, as profits of in this case, the said sum of $7,183.60 as the profits the defendant made on goods sold by it, on the manufacture of which the infringing machine was employed.

I do not consider, however, that such is the law in the case of unpatented products produced by a patented machine, and do find as matters of law in such cases, and in this case, that only such savings of labor as the defendant saved by the employment of the complainant's patented device over and above what their cost would be produced by any other efficient method open for him to use in the pro-

duction of these buckles is properly recoverable in this case as profits.

Under this limitation the evidence is very contradictory as to what the exact savings were.

The complainant puts this saving at 10 or 12 cents a gross, and supports the statement with the report of a certain test and considerable detail.

The defendants put on the stand Mr. E. A. Smith, who estimates that these buckle levers could have been made by old, well-known, and easy processes, open to all the world, for from $1\frac{1}{2}$ to 2 cents a gross. Mr. Smith was a witness of very large experience in the manufacture of similar brass goods, and his estimate is probably as good as any off-hand estimate would be, but is still only an estimate.

243 It also put on Mr. Fergus Kelly, the foreman of the Osborn & Cheeseman Manufacturing Co., at Naugatuck, Conn., which company, under his supervision, made a small lot of similar, but inferior, buckles in 1878, who testified that these buckles were made at a cost of $3\frac{1}{2}$ cents a gross.

Then Mr. E. S. Smith, the treasurer and manager of the defendant corporation, presents the statement of the defendant, which he supports by his oath, that the production of the buckles on the infringing machine cost it for labor $8\frac{3}{10}$ cents per gross.

I cannot suppose that Mr. Kelly intended to cheapen the cost of those old buckles which the Osborn & Cheesman Company asked $1.25 per gross for and still have to a large amount on hand.

But his cross-examination showed the fact that his recollection of the cost of the Osborn & Cheesman buckle was not very distinct, and that an aggregation of the prices as stated by him in detail would amount to more than two cents above the first-named costs, which, taken with the further fact that the Osborn & Cheesman goods had less work upon them, and still were offered for sale at 25 per cent. more than complainant ever asked for his, for years without takers, indicates very strongly that either the goods were inferior or that his memory is greatly at fault as to cost of labor upon them.

The rest of the defendant's testimony on this branch of the case is entirely irreconcilable. It may be, indeed, believed from the declaration of the defendant's manager already quoted, that he would have sold these goods at a very small profit, and possibly without any profit at all, in order to get once hold of the complainant's customers and break him down and give vent to his dislike, but that in order to do it he should adopt the most expensive method he could discover, which would tend to break down his own company without injuring the complainant in the slightest respect, is altogether inconceivable.

The defendant would apparently have it believed that when
244 it could just as well have produced these buckles by old, well-known, easy, and non-infringing methods at an expense for labor by the testimony of E. A. Smith and F. Kelly, its witnesses, ranging from $1\frac{1}{2}$ to $3\frac{1}{2}$ cents a gross, it deliberately adopted

a method costing, on the testimony of E. S. Smith and Lawton, $8\frac{1}{3}$ cents, more than double more to achieve the same results.

That it did so cut its own nose off without the least prospect of advantage to be gained thereby is not to be believed.

One or the other of these claims is manifestly not true. Either the defendant could not have produced these buckles at all by old, well-known, easy, and non-interfering methods open to the public, or else the complainant's patented method adopted by the defendant made a saving over these methods. The defendant adopted the complainant's patented device for some purpose other than increasing expense to itself in supplying itself with these buckles.

I find, therefore, the first fact true and the last one untrue—that is, I find that by the processes known to the art in making similar brass goods open to the public to employ, requiring no invention but simply adaptation, the defendant could have made the levers, but that, so far as the defendant then knew or could then discover or estimate, all such processes were more expensive and costly than the process invented by the complainant and embodied in the automatic machine of the defendant employed by it to make these buckles; and I therefore discard as untrue altogether the defendant's evidence as to savings, which proves instead thereof such needless losings, and rely alone on the complainant's evidence as to this fact.

The complainant proves that his machine saved 10 or 12 cents a gross over the old methods, and that defendants' machine, if like it, must have saved as much.

These machines are found, by the opinion in the principal case, to be substantially alike, and I cannot avoid the conclusion
245 that the defendants saved as much by the employment of its automatic machine as did the complainant by the employment of the patented machine as compared with any other process then known and open to all and adequate to accomplish the work successfully.

Lawton, indeed, says that the defendants' automatic machine did not make over 150 gross of buckle levers a day, while the complainant's would make 285 gross per day; but then, on cross-examination, he admits that it was never run over half a day at a time, which would prove its capacity to be fully equal to that of the complainant's patented machine.

E. S. Smith also asserts, as before referred to, that its statement is entirely correct in making the cost per gross of these buckles, in the respect of labor, $8\frac{1}{3}$ cents; but, on cross-examination, he shows himself unable to establish the fact but by mere assertion. No count was ever made nor any record kept of either production or expense.

Accepting, then, the saving of the defendant in the production of these buckles to have been the same by the employment of the infringing machine that complainant saved in the employment of the patented machine, as against any other known and open method, which was 10 cents per gross, I find that it saved, by so using the complainant's invention in the manufacture of the said 44,805 gross,

$4,480.50, which I find should be repaid to the complainant as savings or profits in this case.

The complainant further claims damages for this infringement as follows:

1. For reduction of prices:	
Loss on 10,000 gross $\frac{5}{8}$ inch, at 15c	$1,500 00
" 10,000 " $\frac{7}{8}$ " 20c	2,000 00
" 40,000 " $1\frac{1}{8}$ " 22c	8,800 00
Total	$12,300 00
2. Also for loss of profits on sales where defendant supplied complainant's previous customers with buckles made on infringing machine	18,288 71
Total	$30,588 71

246 If the defendant had made and sold the complainant's patented machine, whereby this loss of sales and consequent loss of profits and reduction in selling prices had been suffered by the complainant, I have no doubt but this would be a very plain case of damage in these respects.

It was a production having a very limited demand, and complainant, by reason of his previous patent, had come to supply all that demand, and he had the facilities to continue to supply it.

Not an arctic shoe buckle was on the market from any other source.

Osborn & Cheesman had made a few, but had never put them on the market to any considerable extent. As soon as the monopoly enjoyed by the complainant on the buckle levers themselves was ended the defendant took the complainant's improved instrumentality for making them, adapted it without leave or license, made buckles with it, and with these buckles went for the complainant's old customers.

In fact, it could go nowhere else, and every customer it obtained had been and was the customer of the complainant at the time the defendant went into the market with these goods. No one else touched this trade. Every sale the defendant made reduced by so much the complainant's sales. Defendant was a very active, pushing competitor. Complainant says that the defendant cut the prices, and defendant says that it followed the complainant's prices down in the market. The fact that complainant maintained the best prices would seem to disprove this, but I make no finding in this regard, as it is immaterial in my view of the case.

I find that the complainant could have maintained the prices received by him before the defendant entered the market but for the competition of the defendant, beyond all doubt; and if this is a case for damage at all, the complainant has been damaged to the full of said amount claimed, to wit, $30,588.71, less the amount of savings heretofore reported, and I so find.

247 I am of the opinion, however, and do find, that this is not a proper case for damages. There was no patent on arctic

shoe buckles or these arctic buckle levers at the time of the defendant's infringement of complainant's patents for making them.

Anybody was at liberty to make them by hand, by mandrels and dies, or by any other method open to the public, except the one method practiced by and secured to the complainant.

They were simple of construction, and almost anybody could have made them, and it is beyond a doubt that any experienced worker in brass could have made them by many methods with varying expense.

The complainant was no longer entitled to a monopoly of the market for these goods. He, indeed, had it, but it was his good luck only that kept it to him. The defendant, or anyone else, could rightfully compete for this trade, no matter where or how the competing buckles were procured.

All the complainant was entitled to in the matter, beyond others, was that his increased facility for making them, by means of his patented machine, should remain sacred to him. The one act, therefore, of the defendant of seizing upon the claimant's device in this respect to accomplish therewith what he could have rightly employed any other well-known means to accomplish has only subjected him to such savings in work as he has thereby made.

When one pirates the invention of another he becomes trustee of it for the use and benefit of the inventor, and should be held accountable for as skillful and economic use of the invention as it is ordinarily capable of performing.

I am satisfied that the evidence is true in this case, which shows not only that the defendant should have made the savings in
248 labor by the use of the complainant's invention that is hereinbefore reported, but also that he did in fact save that amount in production.

All of which is respectfully submitted.

E. E. MARVIN,
Master pro hac vice.

Hartford, March 17, 1883.

Fees, as follows, viz:

Making order for accounting	$3 00
Twelve days occupied with taking the evidence bearing and deciding upon said matter of making report, at $15	180 00
Expenses, one day at Waterbury	4 30
Total	$187 30

249 And on the 13th day of April, 1883, complainant's exceptions to master's report was filed, in the words and figures following, viz:

Exceptions to Master's Report.

Circuit Court of the United States, District of Connecticut. In Equity.

LEONARD A. SPRAGUE

vs.

SMITH & GRIGGS MANUFACTURING COMPANY.

Exceptions taken by the complainant to the report made herein by E. E. Marvin, Esq., master *pro hac vice*, to whom this cause was referred by an order of this court made and entered on the —— day of ——, 188 , which report bears date the 17th day of March, 1883.

First exception.

For that the master in his said report did not allow as profits, which the complainant was entitled to recover of the defendant, the sum of seven thousand one hundred and
250 eighty-three dollars and sixty cents ($7,183.60), whereas the master, having found that the defendant made said sum upon the buckle levers made by the patented machine, should have allowed the same to the complainant, the proof being that there was no known method of producing such levers at the date of the Sprague invention, except at a cost exceeding the prices obtained by the defendant for its buckle levers, so that the entire profit on the buckle levers constituted a saving effected by the patented machine.

Second exception.

For that the master in his said report disallowed the complainant's claim for thirty thousand five hundred and eighty-eight dollars and seventy-one cents ($30,588.71) damages, after having found as a fact that, if this were a case for damages at all, the complainant has been damaged to the amount aforesaid, whereas the master should have allowed said sum or said sum less the amount allowed for savings, because said sum represented the injury done to the complainant through the use by the defendant of the patented machine, the fact being, as fully appeared by the evidence before the master, that there was no known way other than by the patented machine by which the defendant could have made said buckle levers as cheaply as they were sold by the complainant when the infringement commenced.

C. E. MITCHELL,
Solicitor for Complainant.

251 And on the 17th day of April, 1883, defendant's exceptions to master's report was filed in the words and figures following, viz:

Circuit Court of the United States for the District of Connecticut.
In Equity.

LEONARD A. SPRAGUE
vs.
THE SMITH & GRIGGS MANUFACTURING COMPANY.

Exceptions taken by the defendant to the report made herein by E. E. Marvin, Esq., master *pro hac vice*, to whom this cause was referred by an order of the court made and entered the 29th day of July, A. D. 1882, which report was filed with the clerk on the 17th day of March, A. D. 1883.

I. For that said master in his said report found that the savings of the defendants by the use of the infringing machine amounted to the sum of $4,480.50, which is unsupported by and contrary to the evidence, whereas the said master should have found that such saving was only the sum of $522.72, and no more.

II. For that said master in his report rejects the testimony
252 of Mr. E. A. Smith, whom he finds "has had large experience in the manufacture of similar brass goods, and whose estimate is probably as good as any off-hand estimate would be," as a mere estimate, and accepts the testimony of the complainant, which is confessedly only an estimate, while it is not shown nor claimed that he has had greater or even as much experience or in anywise more competent to make such estimate.

III. For that said master in his said report finds that the buckles made by Osborn & Cheesman in 1878 were inferior to complainant's buckles, whereas his finding should have been solely with reference to the levers, that portion of the buckle made on the infringing machine, but in either case such finding is not supported by the evidence, but is contrary to the same.

IV. For that the said master in his said report in one place finds from the statement filed by the defendant, and supported by the testimony of Mr. E. S. Smith, manager of the defendant corporation, that the cost of producing levers on the defendant's infringing machine was 8 and $\frac{3}{10}$ cents per gross, while in another place from the same testimony he finds that it cost 8½ cents per gross, neither of which are supported by the evidence, but are in flat contradictions thereof.

V. For that said master in his said report finds from the testimony of Mr. Fergus Kelly as to the cost of the Osborn & Cheesman lever "that an aggregation of the prices stated by him in detail would amount to more than two cents above his first-named cost," which is not supported by the evidence, but is contrary to the same.

VI. For that said master in his said report finds that the Osborn & Cheesman levers had less work upon them than the complainant's levers, which is not supported by the testimony.

VII. For that said master in his said report finds that the testimony of the defendant's witnesses is all untrue, because he
253 finds a supposed discrepancy between the witnesses as to the cost of producing levers by old methods, and the return of the defendant and the testimony of its officers, which supposed discrepancy is not supported by the evidence, but is contrary to the same.

VIII. For that said master in his said report finds that the complainant's patented machine makes a saving of 10 to 12 cents per gross over all old methods, which is not supported by the evidence, but is contrary to the same.

IX. For that said master in his said report finds that the capacity of the defendant's infringing machine was fully equal to that of the patented machine, which is not supported by the evidence, but contrary to the same.

X. For that said master in his said report finds that the defendant, by Mr. Smith, its manager, is unable to establish the fact of the cost of producing levers on the infringing machine, which is contrary to the evidence.

XI. For that said master fails to find in his said report that the cost of producing levers on the infringing machine was $2\frac{1}{3}$ cents per gross; that the cost of producing such levers by old methods was from $2\frac{1}{2}$ to $3\frac{1}{2}$ cents per gross; that the saving to the defendant by using the infringing machine did not exceed $1\frac{1}{6}$ cents per gross, and that the patented machine effected a saving of only $3\frac{1}{3}$ cents per gross over old methods, all of which is supported by and should have been found from the evidence.

Waterbury, April 17, 1883.

DEFENDANT,
By GEORGE E. TERRY,
Its Solicitor

MUNSON & PHILLIPP,
Of Counsel.

And on the 3d day of May, 1884, opinion of court was filed in the words and figures following, viz:

254 Circuit Court of the United States for the District of Connecticut.

LEONARD A. SPRAGUE

v.

THE SMITH & GRIGGS MANUFACTURING COMPANY.

SHIPMAN, *J.*:

I do not think that it is necessary for me to pass upon the accuracy of each one of the statements or opinions in regard to questions of fact which are given in the master's report, and to state whether I do or do not concur in each opinion. I concur in the correctness of his conclusions of law and in the correctness of his

conclusions upon the question of profits. I think that his finding in regard to the amount of the defendant's savings from the use of the plaintiff's patented machine was correct and was justified by the testimony. The whole case and the whole testimony satisfy me that the result which the defendant's witnesses sought to have the court reach would have been an inaccurate one.

255 All the exceptions, both of the plaintiff and the defendant, are overruled, and the master's report is confirmed.

256 At a stated term of the circuit court of the United States of America for the district of Connecticut, in the second circuit, held at Hartford on the 22d day of April, A. D. 1884.

Present: The Honorable N. Shipman, district judge.

LEONARD A. SPRAGUE
vs.
THE SMITH & GRIGGS MANUFACTURING COMPANY.

This cause having come on to be heard upon report of Edwin E. Marvin, Esq., one of the masters of this court, to whom it was referred to ascertain and report to the court an account of the number of machines for making buckle levers made or used by the said defendant and the number of buckle levers made by the defendant thereon, and also the gains, profits, and advantages which the said defendant has received, as well as all damages in excess of profits sustained by the complainant, which report bears date the 17th day of March, A. D. 1883; and also upon exceptions to said report on the part

257 of said complainant, and also on the part of said defendant, and upon the equity reserved; and said cause having been argued by counsel and due deliberation had thereon:

It is ordered, adjudged, and decreed, and this court doth order, adjudge, and decree, that the exceptions on the part of the defendant and the exceptions on the part of the complainant be overruled, and that the decision of said master be approved and adopted as to the amount due from the defendant to the complainant upon said accounting.

And it is further ordered, adjudged, and decreed, and this court by virtue of the power and authority therein vested doth order, adjudge, and decree, that the said defendant pay to the said complainant the sum of four thousand four hundred and eighty dollars and fifty cents ($4,480.50), with interest from said 17th day of March 1883.

And it is further ordered, adjudged, and decreed that the said defendant pay to the said complainant his costs in this suit, to be taxed, and that the said complainant have execution for such costs and for the sum above decreed to be paid to said complainant as aforesaid.

N. SHIPMAN,
District Judge.

258 I, Edwin E. Marvin, clerk of the circuit court of the United States of America in and for the district of Connecticut, do

certify that the foregoing is a true copy of the original bill of complaint, answer, replication, pleadings, proceedings, evidence, opinion, and decree remaining of record and on file in the case of Leonard A. Sprague *vs.* The Smith & Griggs Manufacturing Company in said court.

In testimony whereof I have hereunto set my hand and the seal of said court, at Hartford, in said district, this 14th day of July, A. D. 1884.

[Seal of Circuit Court, Connecticut.]

E. E. MARVIN, *Clerk.*

Endorsed on cover: Connecticut C. C. U. S. No. 272. The Smith and Griggs Manufacturing Company, appellant, *vs.* Leonard A. Sprague. Filed August 4th, 1884.

123-249

1 IN THE SUPREME COURT OF THE UNITED STATES.

No. 29. Oct. Term, 1887.

THE SMITH & GRIGGS MANUFACTURING CO., Appellant,

vs.

LEONARD A. SPRAGUE.

It is hereby stipulated that the annexed printed Patent Office copies of patents are correct copies of the patents filed in evidence on behalf of the complainant in the court below and there marked "Exhibit Sprague's Patent- No. 1 and No. 2," respectively, and that the same may be used on the appeal of this cause to this Court with the same force and effect as if they had formed part of the transcript of the record certified to by the clerk of the court below,
2 and that they may be considered and acted upon as part of said certified transcript of the record in this cause.

GEO. E. TERRY,
Att'y for Appellant.
C. E. MITCHELL,
For Appellee.

3 EXHIBIT SPRAGUE PATENT NO. 1.

(Here follow diagrams marked pp. 4, 5, and 6.)

7 UNITED STATES PATENT OFFICE.

LEONARD A. SPRAGUE, of Brooklyn, E. D., New York.

Machine for Making Buckle-Levers.

Specification forming part of Letters Patent No. 228,136, dated May 25, 1880. Application filed November 11, 1879.

To all whom it may concern:

Be it known that I, Leonard A. Sprague, of Brooklyn, E. D., in the county of Kings and State of New York, have invented certain new and useful improvements in machines for making buckle-levers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a rear view of a machine constructed to carry out my invention. Fig. 2 is a plan view of the lower part of my machine, the upper portion having been removed to show more plainly the details of construction. Fig. 3 is a vertical longitudinal section. Fig. 4 is a vertical transverse section. Fig. 5 is a perspective view

of a modification of the machine represented in Figs. 1, 2, 3, and 4, the modification consisting in a different arrangement of the feeding mechanism and punching-dies, whereby the machine is adapted to receive a ribbon of metal on a line parallel with the mandrel. Fig. 6 is a detached view enlarged of the folder and matrix which bend the blank into U shape. Fig. 7 is a transverse section enlarged of the die and mandrel which perform the next operation in the formation of the lever. Fig. 8 is a transverse section enlarged of the die and mandrel which complete the formation of the lever. Fig. 9 is a perspective view of the lever after it has been acted upon by the dies shown in Fig. 7. Fig. 10 is a perspective view of the completed lever. Figs. 11 and 12 show modified forms of the lever. Fig. 13 is an end view of a buckle-lever made by my machine. Fig. 14 is an end view, partly in section, of a buckle having one of my improved levers applied thereto, and showing also the straps connected by the buckle. Fig. 15 is a plan view of the matrix and its accompanying stops and detents. Fig. 16 is a detached view of two of the dies and their actuating mechanism. Fig. 17 is a plan view of the mechanism for communicating motion to the devices which feed the metal to the machine, as represented in Figs. 1, 2, 3, and 11.

Referring to Figs. 1, 2, 3, and 4 in the drawings, A represents the bed-plate of the machine, which may be supported in any appoved or desired manner.

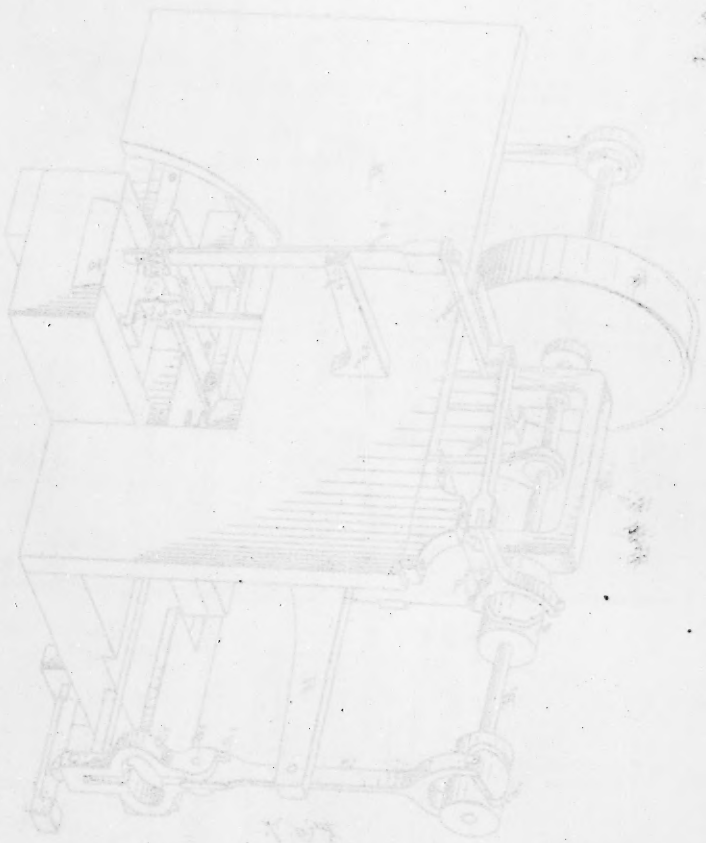
B is a standard rising from the bed-plate A, and may be either cast in one piece with the bed-plate or firmly attached thereto. B′ is a driving-shaft mounted in suitable bearings in the standard B. B^2 is a driving-wheel connected with the driving-shaft B′ by any suitable clutch mechanism.

C is a punch-stock or punch-carrier mounted in or upon the standard B in such a manner as to rise and fall when actuated by means of the connecting-link C′, the upper end of which is mounted upon a crank or eccentric upon shaft B′, the lower end of the link being adjustably connected with the punch-stock by means of the screw c' (see Fig. 5) in such manner that the throw or travel of the pump-stock may be regulated at will. Attached to and moving with the punch-stock are two punches, *c*, their position being shown in dotted lines in Fig. 2.

c^2 c^2 c^2 are punches arranged to punch a series of holes through the blank in such position that when the lever is formed the extreme end of the bit is bent on a line crossing these holes diametrically. The punches *c* punch holes through opposite ends of the blank.

C^2 is a punch, also attached to and carried with the punch-stock C, for the purpose of striking the blank from the ribbons, the bed-plate being provided with throats *d*, corresponding in size and position to the punching-dies.

E E′ E^2 constitute a feeding mechanism, in which E is a block sliding in a suitable groove or way formed for its reception in or upon the bed-plate. E′ is a clamp, the ears *e* of which are pivoted upon opposite sides of the block E, leaving room for the ribbon of metal to pass freely between the clamp and the upper face of said



3 Sheets—Sheet 1.

L. A. SPRAGUE.

Machine for Making Buckle-Levers.

No. 228,136. Patented May 25, 1880.

No. 29.
Page 4.

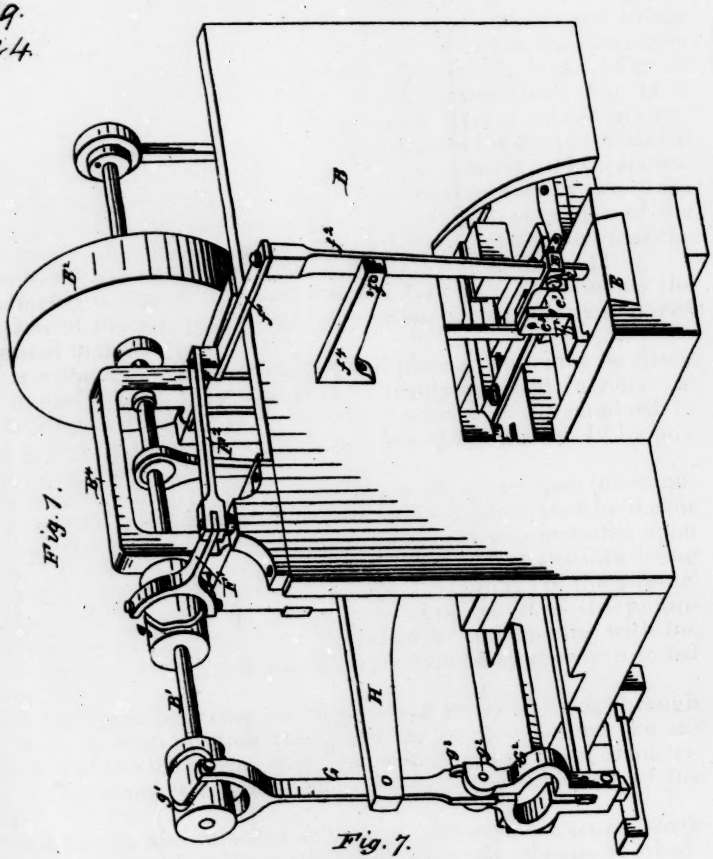
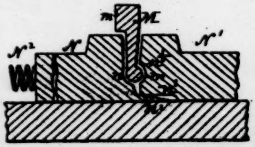
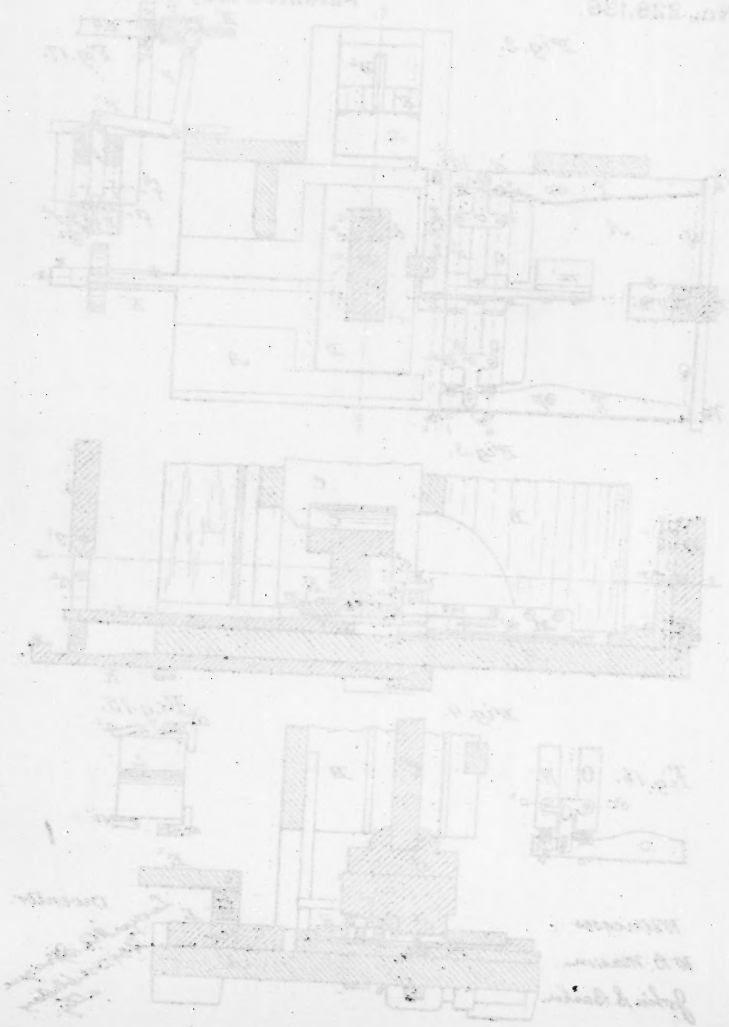


Fig. 7.



Witnesses:
W. B. Mason
J. L. Barker.

Inventor:
Leonard A. Sprague
by
H. W. Doubleday, Atty



3 Sheets—Sheet 3.

L. A. SPRAGUE.

Machine for Making Buckle-Levers.

No. 228,136. Patented May 25, 1880.

No. 29. Page 5.

Fig. 2.

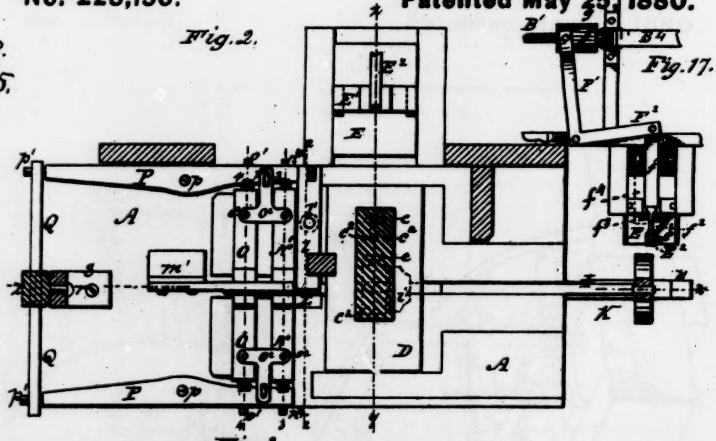


Fig. 17.

Fig. 3.

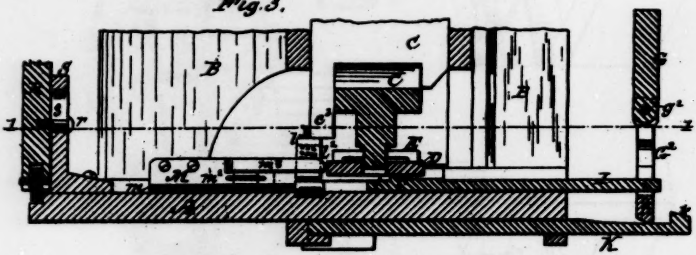


Fig. 4.

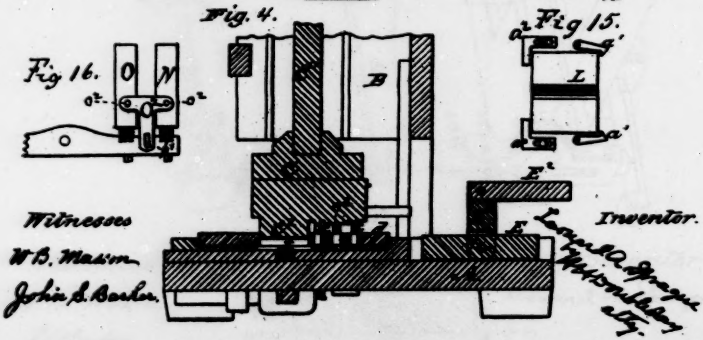


Fig 16.

Fig 15.

Witnesses

W. B. Mason

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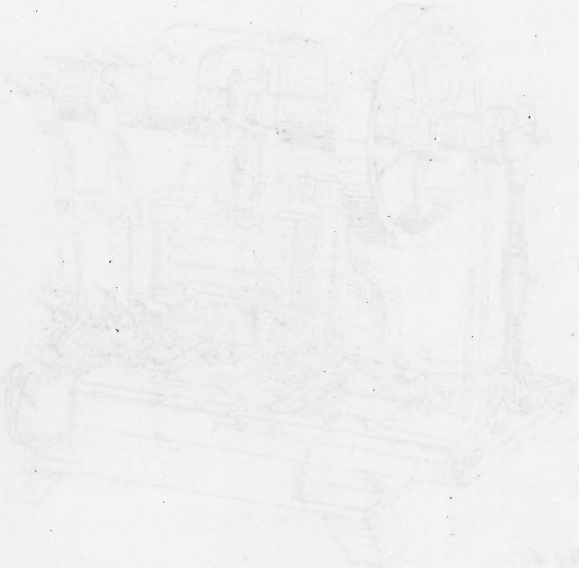
Atty.



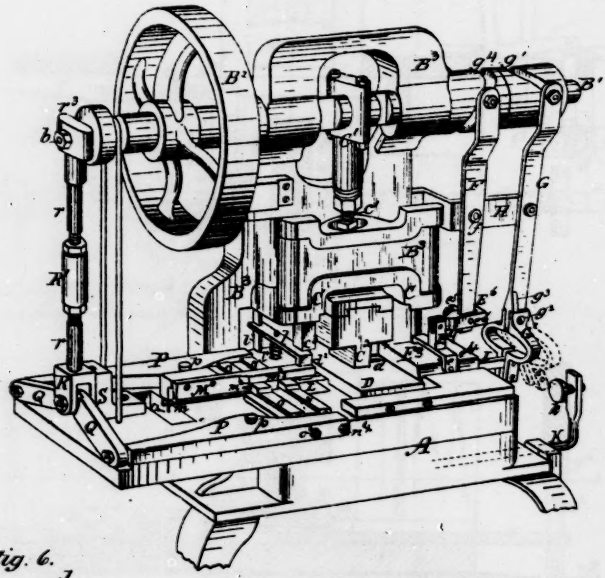
3 Sheets—Sheet 3.

L. A. SPRAGUE.

Machine for Making Buckle-Levers.

No. 228,136. Patented May 25, 1880.

Fig. 5.



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Page 6.

Fig. 6.

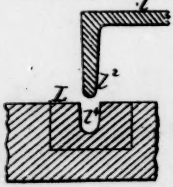

Fig. 11.

Fig. 12.

Fig. 8.

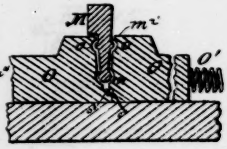

Fig. 7.

Fig. 10.

Fig. 14.

Fig. 13.

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block. E^2 is an arm pivoted to the clamp E′, and connected with the lower end of the lever f^2 by means of the set-screw e'.

This feeding mechanism is actuated as follows: g is a cam-groove formed upon the outer circumference of a cam secured upon the driving-shaft B′. F′ F^2 is a bell-crank lever pivoted at its angle to any suitable support projecting from the frame, and actuated by the cam-groove g so as to vibrate in a horizontal plane. f' is a horizontal link connecting the arm F^2 with the bell-crank lever, with an upright lever, f^2, which is pivoted at f^3, and a support, f^4, which projects from the upright or standard B, the lower end of the lever f^2 being connected with the arm E^2 by means of a set-screw. Thus it will be understood that a reciprocating motion will be communicated from the driving-shaft B′ to the feeding mechanism at each revolution of said shaft.

In Fig. 5 the feeding mechanism consists of a lever, F, pivoted at f, and taking into the cam-groove g^4, a block, E^3, recessed on each side, as at e^4, a clamp, E^4, having its ears e pivoted to block E^3, an arm, E^6, pivoted to clamp E^4 and secured to the lever by a set-screw, e^5, all these parts except the lever being the same in construction as the corresponding parts in the other figures, the clamp being arranged in such relation to the walls of said recesses that as the clamp is thrown forward or toward the dies it (the clamp) is turned upon its pivots in such manner as to gripe the ribbon between the clamp and the upper face of the block, and thus feed the ribbon forward toward the dies; but when the upper end of the clamp is moved backward—that is, away from the dies—it is rocked upon its pivots so as to release the ribbon, and when the ribbon is thus released the ears engage with the rear walls of the slots and move the block E backward with the clamp without disturbing the position of the ribbon.

G is another lever pivoted upon the bracket or arm H, and actuated by means of a cam-groove, g', on shaft B′.

G′ is a loop, pivoted at g^2 upon the lower end of the lever G.

g^3 is a stop formed upon lever G, near its lower end, against which the upper end of the loop G′ engages to form a practically rigid connection between the loop G′ and the lever when the lower end of the lever is moving backward—that is to say, from the dies; but the connection between the loop and the lever by means of the pivot g^2 is a yielding frictional one, which permits a movement of the loop upon its pivot under certain circumstances, as will be hereinafter explained.

It will, of course, be understood that in the machine represented by Figs. 1, 2, 3, and 4 the upright or uprights B subserve substantially the same purpose as the upright marked B^3 in Fig. 5, or any other convenient or approved structure may be employed to support the driving-shaft, driving-wheel, crank, and pitman.

The machine represented in Fig. 5 being identical with that shown in Figs. 1, 2, 3, and 4 in all essential parts, except that in the machine represented in Fig. 5 the strip of metal is fed in on a line substantially parallel with the axis of the mandrel, whereas in the machine represented in Figs. 1, 2, 3, and 4 the metal is fed in on a line

substantially at right angles to the axis of the mandrel, the position of the punches is changed to correspond therewith, the standard-shaft and driving-wheel being left off from Fig. 2 in order to show more clearly the position and relation of the punching and bending mechanism, these parts being left off in Figs. 3 and 4 because they are not essential to a clear understanding of the inventions claimed in this case.

I *i i'* constitute a carrier, constructed to slide freely in a groove formed in the bed-plate A, the inner end, *i*, and transverse plate *i'* being arranged to move immediately below the plate D and in close proximity thereto, as is plainly shown in Figs. 2 and 3.

K *k* is a tripping-bar, connected with mechanism for shipping the belt from the wheel B^2 to a loose pulley on the driving-shaft B' by means of any usual or approved shipping contrivance, which is not shown and need not be described, as I propose to use any of the well-known devices which are employed for that purpose in machines of this class. The projecting upper end, *k*, of this tripping-bar is arranged in a line coincident with the path traveled by the lower end of the loop G', in order that the said loop may engage with and actuate the shipping-bar under certain circumstances, which will be hereinafter referred to.

l^2 is a folder projecting forward from the front end of the horizontal carrier-bar *l*.

l' represents a stud and spiral spring rising from the bed-plate A, the stud projecting through the central part of the horizontal bar *l*, to the front edge of which the folder l^2 is attached, the rear end of said bar being forked and engaging with and sliding upon an upright post, l^3.

A pusher-pin, c^3, projects downwardly from the punch-carrier C and engages with the front end of the bar *l* in such manner as to thrust the folder l^2 down into the recess l^4 formed in the matrix at each downward movement of the die-carrier.

N N' are dies sliding in suitable grooves or ears in or upon the upper side of the bed-plate A, the inner faces of these dies being formed in substantially the shape shown in Fig. 7—that is to say, their grooves to correspond with the rib *m* at the lower edge of the mandrel M. The lower corner of the die N' is recessed, as at *n'*, while the die N is provided with a wedge-shaped tongue, n^2, which enters the recess *n'*.

m^3 is a rib projecting from the upper part of the mandrel M.

As represented in Fig. 7, the rib *m*, at the lower edge of the mandrel, is circular in cross-section, and is arranged eccentric to the vertical shank of the mandrel—that is to say, the rib projects farther upon one side of the mandrel than it does upon the opposite side, and the groove n^x, which is formed in the working-face of the die N', is deeper than the corresponding groove *m*, which is formed in the working-face of the die N, for a purpose which will be hereinafter explained.

9 The dies N N' are forced toward the mandrel by means of the levers P P, which are pivoted to the bed-plate at *p*, the toggle-levers Q Q, and the link R R', which is connected by means

of a coupling or box, r^3, with a crank, b, on the shaft B′, the forked end of this link being connected with the standard S by means of a bolt, r, which moves in a slot, s, in said standard, the standard being bolted to the bed-plate, the nearness with which the dies N N′ approach the mandrel being regulated by set-screws n^4. (See Figs. 2 and 5.)

A spiral or other spring, N^2, is interposed between the outer end of each of the dies N N′ and the inner face of each of the levers, thus insuring that when the set-screws are withdrawn from the ends of the dies the dies shall still be thrust toward or upon the mandrel with a yielding pressure.

As shown in Fig. 7, the parts of the dies between the lower edges of the grooves and the tongue n^2 and recess n are so shaped as to form the lower end or bit of the lever. (See also Fig. 13.)

O O are a second pair of dies, arranged to slide in or upon the bed-plate, and provided upon their inner ends with grooves o o, which correspond to ribs m^2, formed upon the mandrel a short distance above the rib n, these dies O O being adjusted by set-screws o' o' in levers B, and also provided with spiral or other springs surrounding the set-screws between the levers P and the outer ends of the dies. These dies are also constructed at or near their lower edges with spurs o^3 and corresponding depressions o^4, or with waved surfaces, or are otherwise similarly shaped, so as to notch, indent, corrugate, or wrinkle the bits of the levers, as indicated in Figs. 10, 11, 12, the object being to insure that the engaging edge of the bit shall take a firm hold of the strap with which it is in contact. As these levers are sometimes subjected to a heavy strain—as, for instance, when used on skate-straps the ends of which are passed through the slots u'—I have found it desirable to groove or corrugate the ends, as at u^4, in order to increase their strength and rigidity at this point, and thus enable them to sustain without injury the strain in various directions which is applied to them.

O^2 O^2 are **S**-shaped draw-bars or links, adjustably connected with levers P P by means of set-screws p', and also attached to the dies N N′ O O by means of set-screws o^2.

From the above description it will be seen that as the levers P P are withdrawn from the mandrel M the dies are also drawn back slightly from the buckle-levers with a positive movement by the links O^2, but are held forward—that is, against the buckle-levers—with a yielding pressure by springs O′, in order that a slight looseness of the operating parts shall not permit the dies to be so far thrust backward as to permit the buckle-levers to telescope or overlap each other as they push each other forward upon the mandrel.

a^2 a^2, Fig. 15, are guides adjustably secured upon the bed-plate or upon the matrix by means of set-screws in such manner that their inner ends can be set as desired to determine the point to which the blank shall be pushed by the carrier.

a' a' are spring latches or stops attached to the bed-plate with their free ends toward the punching-dies.

My machine may be operated as follows: Referring to Figs. 1, 2, 3, and 4, the metal ribbon is passed in under the clamp E′ of the

feeding machanism, thence under the punches c c^2, and during the backward movement of the feeding mechanism these punches c c^2 punch holes through the metal. The next forward movement of the feeding mechanism thrusts the ribbon under the punch C^2, which punches the blank from the ribbon, and after the punch has been raised above the ribbon the carrier I i i' thrusts the blank upon the matrix L, the position of the cam-grooves g g' upon the shaft B′ relative to the position of the crank or the cam which operates the punches being so timed as to move the ribbon and blank while the punches are up out of the way.

The blank is thrust upon the matrix by the transverse plate i' of the carrier, the part i of the carrier entering the seat in the matrix, and after the carrier is returned to the position shown in the drawings the pusher-pin c^3 thrusts the folder l^2 into the matrix, forming the blank into **U** shape. As the blank is thus thrust upon the matrix it (the blank) separates the free ends of the springs or detents a', which yield, but close their hooked ends upon the rear side of the blank, so as to prevent its being withdrawn by the backward movement of the carrier, which would sometimes occur were it not for these springs, especially in case the carrier has a little oil upon it. As a blank is thus formed into **U** shape one of its ends is turned upward against the mandrel immediately below the rib m^3, so that when the folder l^2 is withdrawn into the position shown in the drawings the partially-formed blank remains in the matrix, the rib m^3 serving as a stop, against which the end of the blank strikes. Were it not for this stop m^3 the blank would be liable to be withdrawn with the folder to such a distance that the carrier would not push it (the blank) upon the mandrel.

The next forward movement of the carrier, bringing with it a new blank, pushes the **U**-shaped piece upon the mandrel, the part i of the carrier being a little longer than the blank is wide, so that it projects in front of the blank and pushes the **U**-shaped one upon the mandrel and between the dies N N′ without the new blank coming in contact with this partially-formed **U**-shaped one. As the carrier is again withdrawn the folder l^2 presses the new blank into the matrix L, and the dies N N′ compress the **U**-shaped blank upon the mandrel, thus forming it into the shape indicated in Fig. 9, during which operation the wedge-shaped tongue is thrust under the part n and presses it firmly against the under side of the rib m, as will be readily understood by an examination of Fig. 7.

The dies N N′ O O are advanced toward the mandrel by the action of the toggle-joint Q Q and levers P P, the advance of these dies being regulated at will to correspond with the thickness of the metal by means of the set-screws n^4; and in order to facilitate the forcing of the **U**-shaped blank upon the mandrel and the dies N N′, it may be found desirable to bevel or chamfer slightly the corners of the ends of these dies upon that side toward the advancing blank.

The next revolution of the shaft B′ and second advance of the carrier places a new blank upon the matrix and another partially-formed one, or a **U**-shaped one, upon the mandrel, and forces the one which has been acted upon by the dies N N′ forward upon the man-

drel between the dies O O, so that when these dies are advanced toward the mandrel the upper edges of the metal are compressed upon the ribs m^2, the formation of the lower portions of these dies swaging or punching the notches, indentations, or wrinkles into the engaging-edge of the bit, thus completing the formation of the lever; and each subsequent revolution of the shaft B′ repeats these operations substantially described, and advances the levers to completion and until they drop off the end of the mandrel and fall through the opening a^4 in the bed-plate.

It will be seen that from the fact that the central part of the buckle-lever fits closely around the lower part of the mandrel while the upper edges are being compressed upon the ribs m^2, said part m of the mandrel serves to support the lever against the downward thrust of the upper part of the dies O O, thus insuring the proper formation of the said upper parts of the lever.

In order to prevent the blanks from telescoping or sliding past one another upon the mandrel as they are pushed forward by the end i of the carrier I employ springs N′ O^2, interposed between the outer ends of the dies and the levers P P, these springs acting to press the dies firmly against the blank upon the mandrel during a portion of the movement of the levers P P outward, thus permitting the dies to yield sufficiently to allow the blank to be advanced upon the mandrel.

If from any cause the carrier fails to push the blank upon the mandrel properly, or if any other irregularity in the movement of the blank occurs in such manner as to interpose any unusual resistance to the forward movement of the carrier, the loop G^2 will swing upon its pivot g^2, thus allowing the lower end of the lever to advance without moving the carrier, the position of the loop relative to the lever under these circumstances being shown in dotted lines, Fig. 5, the result being that upon the backward movement of the lower end of lever G the lower end of the loop will engage with the tripping-bar K k and disconnect the driving-shaft from its actuating power, thus stopping the machine and avoiding any injury to parts which would be likely to result from the machine continuing in motion after an irregularity in its operation had occurred.

Referring to Fig. 7, it will be understood that the tongue n^2 supports the lower end of the part u of the lever firmly while the dies N N′ are compressing the metal upon the mandrel; but owing to the wedge shape of this tongue, when the die N is withdrawn from the mandrel the blank is released from upward pressure against the mandrel, so that it can be readily fed forward to the dies O O.

In Fig. 5, which is a modification of the machine shown in Figs. 1, 2, 3, and 4, I have shown a construction in which the metal ribbon, instead of being fed to the machine upon a line at right angles to the carrier I i i' and the mandrel, is fed upon a line substantially parallel to the path traveled by the carrier, the ribbon in this instance passing through the loop G^2 and under the clamp E′ of the feeding mechanism.

By an examination of this Fig. 5 it will be understood that the position of the punches c c^2 and C^2 has been changed to correspond

with this change in the direction of feeding the ribbon, so that as the ribbon is fed forward by successive impulses the punches punch holes in the blank, and then the punch C^2 punches the blank from the ribbon, and the skeleton which is left after the blanks have been punched passes over the bar *l*, which carries the folder l^2, the pusher-pin c^3 being so located as to pass through the open places in the ribbon-skeleton from which the blanks have been punched. The skeleton passes over the mandrel M and down through the opening a^4 in the bed-plate.

By an examination of Figs. 7, 11, 12, 13, and 14 it will be seen that the buckle-lever is adapted to be used upon a buckle-frame constructed of two side bars, V (one only being shown in Fig. 14), the side bars being tied together by two end bars, v' v^2, and a central bar, *v*. the lever being mounted upon the central bar, *v*, by means of the central groove or seat, u^2 u^3, the groove u^2 being of greater depth than the groove u^3 upon the opposite side of the lever.

The object in forming the lever with the groove eccentric thereto—that is to say, with the groove u^2 deeper than the groove u^3—is to insure that the central bar, *v*, of the buckle-frame shall not spread the sheet of metal of which the lip or bit *u* is made when the straps which the buckle unites are under tension. In Fig. 14 I have illustrated this feature my invention, as follows:

W′ is a strap attached to the open or forked end of the buckle-lever. W is another strap passing inside the end bar, v', thence around the end of the bit or lip of the lever, thence under the end bar, v^2, of the buckle-frame, the direction of pull upon the straps being indicated by the arrows; and from an examination of this figure it will be readily seen that in consequence of the bar *v* being seated in the deep groove u^2 of the lever the tension or draft upon the straps has but little tendency to spread the lever at the lip or bit *u*. When preferred, however, a strap, instead of being inserted between the ends of the legs of the buckle, may be passed through the slots u', as is customary in this class of buckles.

I have shown in the drawings three forms of my improved buckle-lever bit.

In Fig. 10 the irregularity in outline of the bit is produced by the holes punched by punches c^2 at that point where the metal is doubled back upon itself, while in Figs. 11 and 12 the engaging-edge of the bit is struck into shape after it has been acted upon by the dies N N′.

In view of the fact that my buckle-lever may be made by the method herein deseribed and upon two or more machines, it will be readily understood that it may be found desirable to sell the blanks in the shape in which they leave the punching-dies as an article of commerce, said blanks to be afterward manufactured into levers by machines which are organized differently from that which forms the subject of this patent; and it will be seen that a blank which has the slots u' and the holes punched by the punches c^2, which holes form notches when the lever is completed, is particularly adapted to be bent into a lever.

I do not in this application claim the combination, with the matrix L, the folder l^2, and the carrier I *i i'*, of the adjustable stops *a a;* nor do I claim, as a new article of manufacture, a buckle-lever formed from a single piece of sheet metal folded back upon itself, the fold being made upon a line transverse to the side of the strip or sheet of metal from which the lever is made, preferring to claim these matters in another application which I have filed; nor do I claim the notched or pointed or corrugated end or bit of the lever, nor the method or sequence of operations by which I produce the same, as I propose to make these features the subject of another application which I am preparing to file. In this case I do not claim any feature of invention shown or described herein except those which are specifically embraced in the following claims.

Having thus described my invention, what I claim is—

1. In combination with the mandrel M, provided at its lower edge with the rib *m* and with the short ribs m^2 m^2, the dies N N' O O, whereby, after the partially-formed lever has been acted upon by dies N N', the rib *m* serves as a support or guide over which said lever may be moved to a proper position relative to dies O O, substantially as set forth.

2. In a machine for making buckle-levers, the combination of the mandrel M, the dies N N', advanced on planes substantially at right angles to the planes of the partially-formed buckle-lever, and the tongue n^2, attached to the die N, substantially as set forth.

3. In a machine for making buckle-levers, the combination, with the mandrel, the punch which punches blanks from a continuous sheet of metal, and two or more dies which successively form the metal into the desired shape, of a carrier which moves a blank from the punches to the forming-dies and advances the partially-formed levers against the preceding lever, substantially as set forth.

4. In a machine for making buckle-levers, the combination, with the matrix L and folder l^2, of the dies N N', the mandrel arranged to receive the blank from the matrix, and the carrier, substantially as set forth.

5. In a machine for making buckle-levers, the combination, with the mandrel M and dies N N', of the springs N^2 N^2, to press the dies forward into proper position relative to the mandrel, substantially as set forth.

6. In a machine for making buckle-levers, the combination, with the folder l^2, of the pusher-pin c^3, attached to and moving with the punch-stock C, and a returning-spring, which lifts the folder, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of October, 1879.

LEONARD A. SPRAGUE.

Witnesses:

H. H. DOUBLEDAY.

H. VAN RODER.

12 EXHIBIT SPRAGUE PATENT NO. 2.

(Here follow diagrams marked pp. 13, 14, and 15.)

16 UNITED STATES PATENT OFFICE.

LEONARD A. SPRAGUE, of Brooklyn, E. D., New York.

Machine for Making Buckle-Levers.

Specification forming part of Letters Patent No. 231,199, dated August 17, 1880. Application filed December 2, 1878.

To all whom it may concern:

Be it known that I, Leonard A. Sprague, of Brooklyn, E. D., in the county of Kings and State of New York, have invented certain new and useful improvements in machines for making buckle-levers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which for a part of this specification.

Figure 1 is a plan view, partly in section, of a machine embodying my invention. Fig. 2 is a vertical longitudinal section. Fig. 3 is a vertical transverse section. Fig. 4 is a rear view of a machine embodying my invention. Fig. 5 is a detached view, enlarged, of the die and matrix which bend the blank into U shape. Fig. 6 is a transverse section, enlarged, of the die and mandrel which perform the next operation in the formation of the lever. Fig. 7 is a transverse section, enlarged, of the dies and mandrel which complete the formation of the lever. Fig. 8 is a perspective view of the lever after it has been acted upon by the dies shown in Fig. 6. Fig. 9 is a perspective view of the completed lever. Fig. 10 is a plan view of the matrix and dies accompanying stops and detent. Fig. 11 is a detached view of two of the dies and their actuating mechanism. Fig. 12 is a plan view of the mechanism for imparting motion to the devices which feed the strip of metal to the machine represented in Figs. 1, 2, and 3. Fig. 13 is a perspective view of a modification of the machine represented in Figs. 1, 2, 3, and 4, the modification consisting in arranging the feeding mechanism and punching-dies upon a line at right angles to the position in which they are shown in the other figures, whereby the machine is adapted to receive a ribbon of metal on a line parallel with the mandrel, a single lever being employed to transmit motion from the driving-shaft to the feeding mechanism. Fig. 14 is an end view of a buckle-lever made by my machine. Fig. 15 is an end view, partly in section, of a buckle having one of my improved levers applied thereto, and showing also straps connected by the buckle.

In the drawings, A represents the bed-piece of the machine, which may be supported in any approved or desired manner. B is a stand-

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L. A. SPRAGUE.

Machine for Making Buckle Levers.

No. 231,199. Patented Aug. 17, 1880.

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Fig. 1.

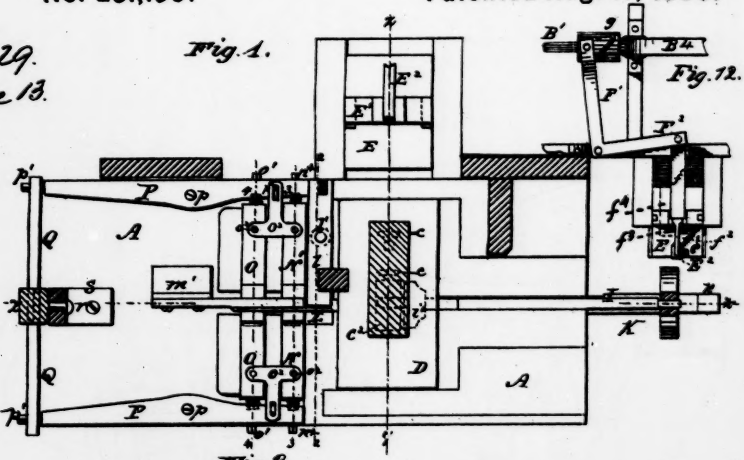


Fig. 12.

Fig. 2.

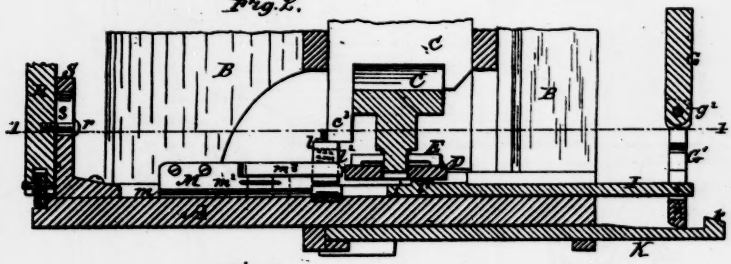


Fig. 3.

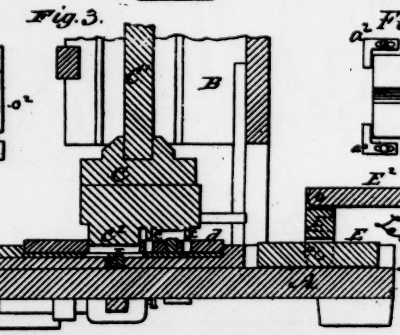


Fig 11

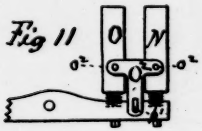
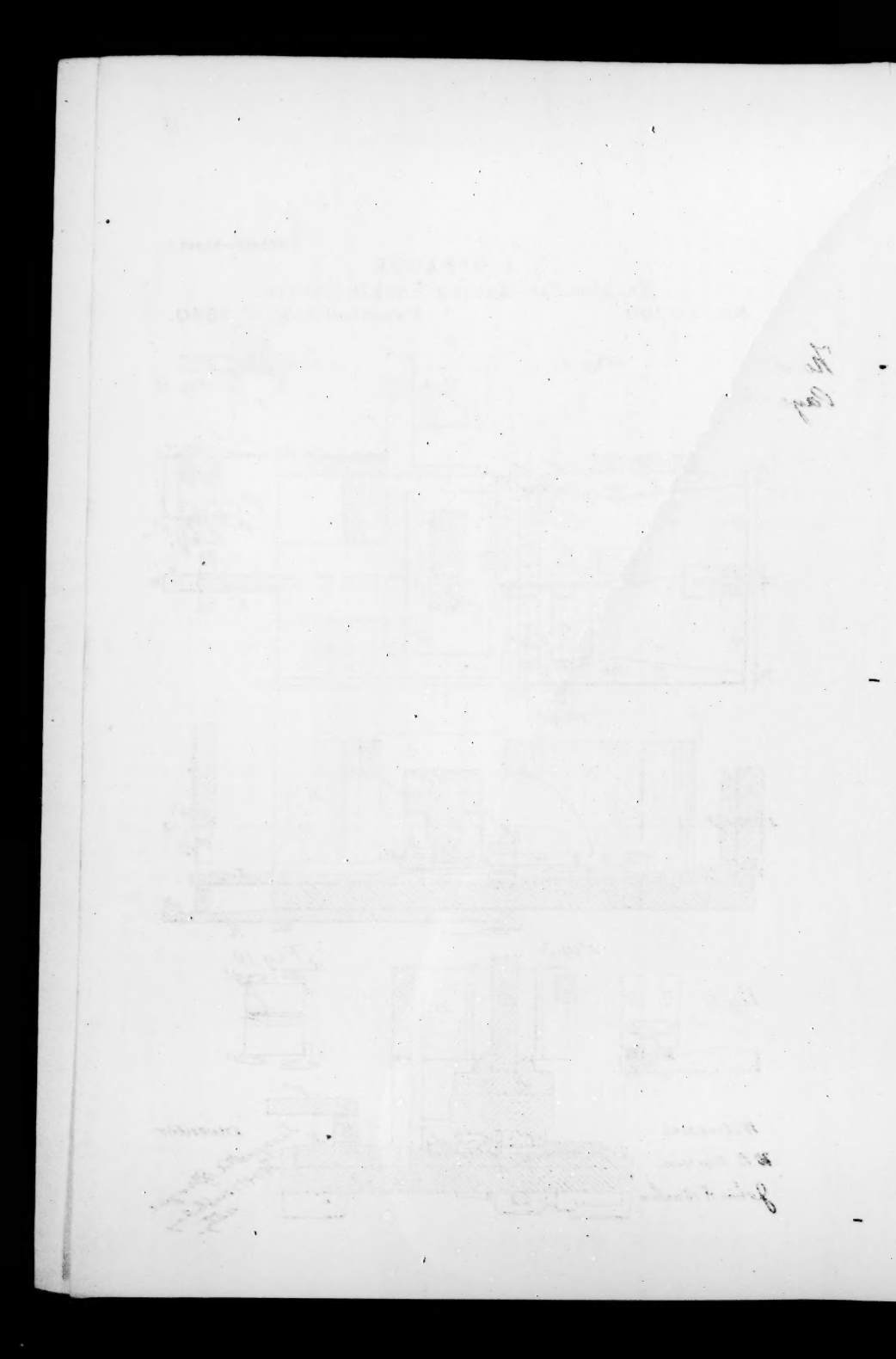


Fig 10

Witnesses
W. B. Mason
John S. Barker.

Inventor:
Lemuel A. Sprague
by Whittemore & Hopkins
atty.



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L. A. SPRAGUE.

Machine for Making Buckle Levers.

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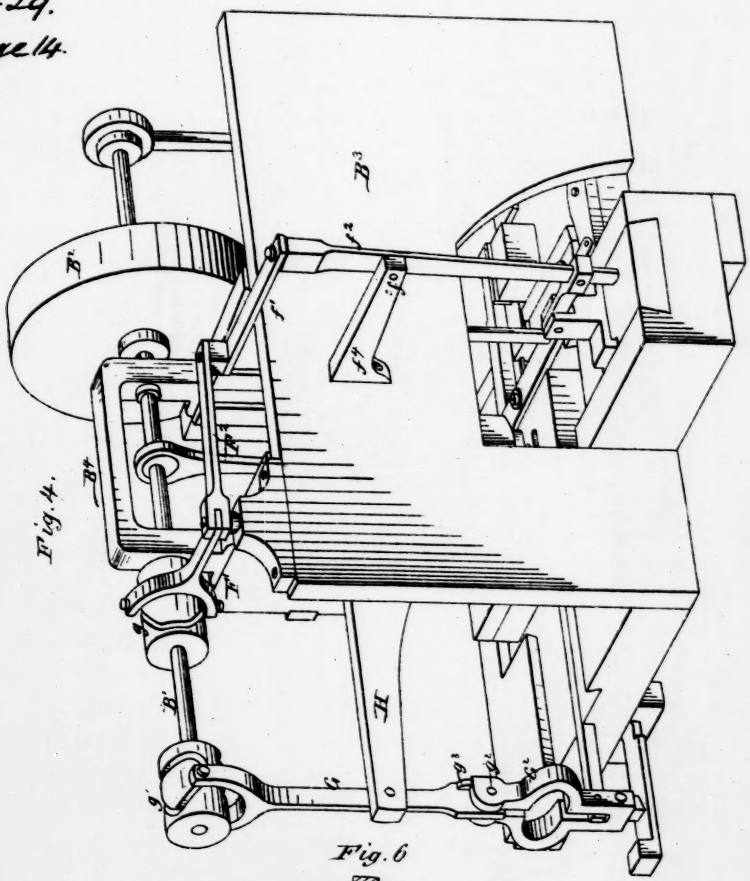
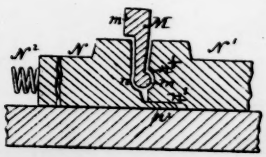


Fig. 4.

Fig. 6



Witnesses:
W. B. Mason
J. S. Barker.

Inventor:
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by
B. A. Doubleday Atty.

3 Sheets—Sheet 3.

L. A. SPRAGUE.

Machine for Making Buckle Levers.

No. 231,199. **Patented Aug. 17, 1880.**

Fig. 13.

No. 29.
Page 15.

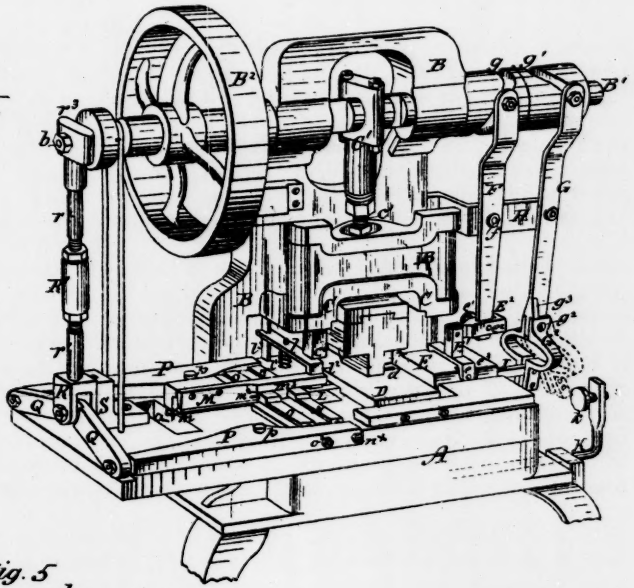

Fig. 5

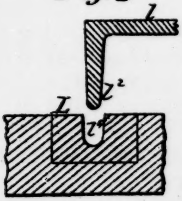

Fig. 7.

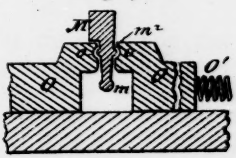

Fig 8

Fig. 9

Fig. 15

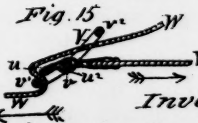

Fig. 14.

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Atty

ard rising from the bed-plate A, and may be either cast in one piece with the bed-plate or firmly attached thereto. B′ is the driving-shaft, mounted in suitable bearings in the standard B. B^2 is the driving-wheel, connected with driving-shaft B′ by any suitable clutch mechanism. C is a die-stock or die-carrier, mounted in or upon the standard B in such manner as to rise and fall when actuated by means of the connecting-link C′, the upper end of which is mounted upon a crank or eccentric on shaft B′, the lower end of the link being adjustably connected with the die-stock by means of the screw c' (see Fig. 4) in such manner that the throw or travel of the die-stock may be regulated at will.

Attached to and moving with the die-stock are two dies, *c*, one of which is shown in Fig. 4, the position of both, however, being shown in dotted lines in Fig. 1, which figure represents the machine constructed to feed the ribbon of metal to the punch-dies at a line at right angles to the path of the blank after it has been punched from the ribbon, as and for a purpose set forth, which will be hereinafter explained. These two dies punch small holes or slots through opposite ends of the blanks, as will be readily understood from an examination of Fig. 1.

c^2 is a die, also attached to and moving with the die-stock C, for the purpose of striking the blank from the ribbon, the plate D being provided with two throats, *d*, corresponding in size and position to the two dies *c*, and with another throat corresponding to the die c^2, as will be readily understood from an examination of Figs. 1 and 4.

E E′ E^2 constitute a feeding mechanism, in which E is a block sliding in a suitable groove or way formed for its reception in or upon the bed-plate A. E′ is a clamp, the ears *e* of which are pivoted upon opposite sides of the block E, leaving room for the ribbon of metal to pass easily between the clamp and the upper face of said block.

E^2 is an arm pivoted to the clamp E′, and adjustably connected with the lower end of the lever by means of a set-screw, e', and pivot e^2.

I will now describe the mechanism employed for actuating the feeding-clamp.

17 Referring to Fig. 12, *g* is a cam-groove formed upon the outer circumference of a cam secured upon the driving-shaft B′.

F′ F^2 is a bell-crank lever, pivoted at its angle to any suitable support of the frame and actuated by the cam-groove *g*, so as to vibrate in a horizontal plane. f' is a horizontal link connecting the arm F^2 of the bell-crank lever with an upright lever, f^2, which is pivoted at f^3 to a support, f^4, which projects from the upright or standard B, the lower end of the vertical lever f^2 being connected with the arm E^2 by means of a set-screw or pivot, e'. Thus it will be understood that a reciprocating motion will be communicated from the driving-shaft B′ to the feeding mechanism at each revolution of said shaft.

In Fig. 13 the same feeding mechanism is employed, and is actuated by a modified construction and arrangement of levers, in which

a lever, F, is pivoted at f to an arm, H, which projects from the standard B, the upper end of the lever taking into the cam-groove g.

The ears e are pivoted in recesses formed for their reception in the sides of block E in such relation to the walls of said recesses that as the clamp is thrust forward or toward the dies it (the clamp) is rocked forward upon its pivots in such manner as to gripe the ribbon between the clamp and the upper face of the block, and thus feed the ribbon forward toward the dies, but when the upper end of the clamp is moved backward—that is, away from the dies—it is rocked upon its pivots so as to release the ribbon, and when the ribbon is released the ears e engage with the rear walls of the slots e^3, and thus move the block E backward with the clamp without disturbing the position of the ribbon.

G is another lever pivoted upon the bracket or arm H and actuated by means of a cam-groove, g', on shaft B'. G' is a loop pivoted at g^2 upon the lower end of the lever G^2. g^3 is a stop formed upon lever G near its lower end, against which stop the upper end of the loop G' engages to form a practically rigid connection between the loop G' and the lever when the lower end of the lever is moving backward—that is to say, from the dies; but the connection between the loop and the lever by means of the pivot g^2 is a yielding frictional one, which permits a movement of the loop upon its pivot under certain circumstances, as will hereinafter be explained.

It will, of course, be understood that in the machine represented in Figs. 1, 2, and 3 there is an upright substantially like that represented by B in Fig. 13, with a driving-shaft, driving-wheel, and crank and pitman (represented by B', B^2, and C' in Fig. 13), this upright being represented by B^4 in Fig. 13, the standard, shaft, and driving-wheel being left off from Figs. 1, 2, and 3, in order to show more clearly the position and relation of the punching and bending mechanism, the standard, shaft, and driving wheel or pulley being left off in Figs. 2 and 3, because they are not essential to the clear understanding of the parts more specifically shown and referred to in these figures. And it will be readily understood that the driving-shaft B', cam-groove g, and the part B in Fig. 12 correspond to the similarly-lettered parts in Fig. 13, and occupy the same relation to the mechanism represented in Fig. 1.

I i i' constitute a carrier constructed to slide freely in a groove formed in the bed-plate A, the inner end i, and transverse plate i' being arranged to move immediately below the plate D, and in close proximity thereto, as is plainly shown in Figs. 1 and 2.

K is a tripping-bar connected with mechanism for unclutching the wheel B^2 from the driving-shaft B' by means of any usual or approved shipping contrivance, which is not shown, and need not be described, as I propose to use any of the well-known devices which are employed for that purpose in machines of this class. The projecting upper end, K, of this tripping-bar is arranged in a line coincident with the path traveled by the lower end of the loop G', in order that said loop may engage with and actuate the shipping-bar under certain circumstances, which will be hereinafter referred to.

l^2 is a folder projecting downward from the front end of a horizontal carrier-bar, l.

l' represents a stud and spiral spring rising from the bed-plate A, the stud projecting through the central part of the horizontal bar l, to the front edge of which the folder l^2 is attached, the rear end of said bar being forked and engaging with and sliding upon an upright pivot, l^3.

A pusher-pin, c^3, projects downwardly from the die-carrier C and engages with the front end of the bar l in such manner as to thrust the folder l^2 down into the recess l^4 formed in the matrix L (see Fig. 5) at each downward movement of the die-carrier.

N N′ are dies sliding in suitable grooves or ways in or upon the upper side of the bed-plate A, the inner faces of these dies being formed in substantially the shape shown in Fig. 6—that is to say, they are grooved to correspond with the rib m at the lower edge of the mandrel M (see Figs. 1 and 6), the inner lower corner of the die N′ being recessed, as at n', while the die N is provided with a wedge-shaped tongue, n^2, which enters the recess n'. (See Fig. 6.)

m^3 is a rib projecting from the upper part of the mandrel M. As represented in Fig. 6, the rib m at the lower edge of the mandrel M is circular in cross-section, and is arranged eccentrically to the vertical shank of the mandrel—that is to say, the rib m projects farther upon one side of the mandrel than it does upon the opposite side, and the groove n which is formed in the working-face of the die N′ is deeper than the correspondiug groove n, which is formed in the working-face of the die N, for a purpose which will be hereinafter explained.

18 The dies N N′ are forced toward the mandrel by means of the levers P P, which are pivoted to the bed-plate at p, the toggle-levers Q Q, and the link R R′, which is connected, by means of a coupling or box, r^3, with a crank, b, on shaft B′, the forked end R of this link being connected with the standard S by means of a bolt, r, which moves in a slot, s, in said standard, the standard being bolted to the bed-plate, the nearness with which the dies N N′ approach the mandrel being regulated by set-screws n^x. (See Figs 1 and 13.)

A spiral or other spring, N^2, is interposed between the outer end of each of the dies N N′ and the inner face of each of the levers, thus insuring that when the set-screws are withdrawn from the ends of the dies the dies shall still be thrust toward or upon the mandrel with a yielding pressure.

O O are a second pair of dies arranged to slide in or upon the bed-plate, and provided upon their inner ends with grooves o o, which correspond to ribs m^2, formed upon the mandrel a short distance above the rib m, these dies O O being connected by set-screws o' o' in levers P, and also provided with spiral or other springs, O′, surrounding the set-screws between the levers P and the outer ends of the dies.

O^2 O^2 are T-shaped draw bars or links, adjustably connected with levers P P by means of set-screws p', and also attached to the dies N N′ O O by means of set-screws o^2 o^2.

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It will, of course, be understood that in the machine represented in Figs. 1, 2, and 3 there is an upright substantially like that represented by B in Fig. 13, with a driving-shaft, driving-wheel, and crank and pitman (represented by B′, B^2, and C′ in Fig. 13), this upright being represented by B^4 in Fig. 13, the standard, shaft, and driving-wheel being left off from Figs. 1, 2, and 3, in order to show more clearly the position and relation of the punching and bending mechanism, the standard, shaft, and driving wheel or pulley being left off in Figs. 2 and 3, because they are not essential to the clear understanding of the parts more specifically shown and referred to in these figures. And it will be readily understood that the driving-shaft B′, cam-groove g, and the part B in Fig. 12 correspond to the similarly-lettered parts in Fig. 13, and occupy the same relation to the mechanism represented in Fig. 1.

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A pusher-pin, c^3, projects downwardly from the die-carrier C and engages with the front end of the bar l in such manner as to thrust the folder l^2 down into the recess l^4 formed in the matrix L (see Fig. 5) at each downward movement of the die-carrier.

N N′ are dies sliding in suitable grooves or ways in or upon the upper side of the bed-plate A, the inner faces of these dies being formed in substantially the shape shown in Fig. 6—that is to say, they are grooved to correspond with the rib m at the lower edge of the mandrel M (see Figs. 1 and 6), the inner lower corner of the die N′ being recessed, as at n', while the die N is provided with a wedge-shaped tongue, n^2, which enters the recess n'. (See Fig. 6.)

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A spiral or other spring, N^2, is interposed between the outer end of each of the dies N N′ and the inner face of each of the levers, thus insuring that when the set-screws are withdrawn from the ends of the dies the dies shall still be thrust toward or upon the mandrel with a yielding pressure.

O O are a second pair of dies arranged to slide in or upon the bed-plate, and provided upon their inner ends with grooves o o, which correspond to ribs m^2, formed upon the mandrel a short distance above the rib m, these dies O O being connected by set-screws o' o' in levers P, and also provided with spiral or other springs, O′, surrounding the set-screws between the levers P and the outer ends of the dies.

O^2 O^2 are T-shaped draw bars or links, adjustably connected with levers P P by means of set-screws p', and also attached to the dies N N′ O O by means of set-screws o^2 o^2.

From the above description it will be seen that as the levers P P are withdrawn from the mandrel M the dies are also drawn back slightly from the blanks with a positive movement by the links O^2, but are held forward—that is, against the blanks—with a yielding pressure by springs O′, in order that a slight looseness of the operating parts shall not permit the dies to be so far thrust backward as to permit the blanks to telescope or overlap each other as they push each other forward upon the mandrel.

a^2 a^2, Fig. 10, are guides adjustably secured upon the bed-plate or upon the matrix by means of set-screws in such manner that their inner ends can be set as desired to determine the point to which the blank shall be pushed by the carrier.

a' a' are spring latches or stops attached to the bed-plate, with their free ends toward the punching-dies.

My machine may be operated as follows: Referring to Figs. 1, 2, and 3, the metal ribbon is passed under the clamp E′ of the feeding mechanism, thence under the dies *c c*, where it pauses, and during the backward movement of the feeding mechanism these dies punch two holes through the metal. The next forward movement of the feeding mechanism thrusts the ribbon underneath the die c^2, which punches the blank from the ribbon, and after the die c^2 has been raised above the ribbon the carrier I i i' thrusts the blank upon the matrix L, the position of the cam-grooves g g upon the shaft B′ relative to the position of the crank or the cam which operates the punching-dies being so timed as to move the ribbon and the blank while the dies are up out of the way. The blank is thrust upon the matrix by the transverse plate i' of the carrier, the part i of the carrier entering the seat in the matrix, and after the carrier is returned to the position shown in the drawings the pusher-pin c^3 thrusts the folder l^2 into the matrix, forming the blank into **U** shape. As the blank is thus thrust upon the matrix it (the blank) separates the free ends of the springs or detents a', which yield, but close their hooked ends upon the rear side of the blank, so as to prevent its being withdrawn by the backward movement of the carrier, which would sometimes occur were it not for these springs, especially in case the carrier has a little oil upon it. As a blank is thus formed into **U** shape one of its ends is turned upward against the mandrel immediately below the rib m^3, so that when the former l^2 is withdrawn into the position shown in the drawings the partially-formed blank remains in the matrix, the rib m^2 serving as a stop against which the end of the blank strikes. Were it not for this stop m^3 the blank would be liable to be withdrawn with the folder to such distance that the carrier would not push it (the blank) upon the mandrel. The next forward movement of the carrier, bringing with it a new blank, pushes the **U**-shaped piece upon the mandrel, the end of the carrier being a little longer than the blank is wide, so that it projects in front of the blank and pushes the **U**-shaped one upon the mandrel and between the dies N N′ without the new blank coming in contact with this partially-formed **U**-shaped one. As the carrier is again withdrawn the former l^2 presses the new blank into the matrix L, and the dies N N′ compress the **U**-shaped blank upon the mandrel, thus forming it into

the shape indicated in Fig. 8, as will be readily understood by an examination of Fig. 6. The dies N N′ O O are advanced toward the core by the action of the toggle-joint Q Q and levers P P, the advance of these dies being regulated at will to correspond with the thickness of the metal by means of the set-screws n^x and o'.

In order to facilitate the forcing of the **U**-shaped blank upon the mandrel and between the dies N N′ it may be found desirable to bevel or chamfer slightly the corners of the ends of the dies upon that side toward the advancing blank.

The next revolution of the shaft B′ and second advance of the carrier places a new blank upon the matrix and another partially-formed one or **U**-shaped one upon the mandrel, and forces the one which has been acted upon by the dies N N′ forward upon the mandrel between the dies O O, so that when these dies are advanced toward the mandrel the upper edges of the metal are compressed upon the ribs m^2, thus completing the formation of the lever, and each subsequent revolution of the shaft B repeats these operations, substantially as described, and advances the completed levers until they drop off the end of the mandrel and fall through the opening a^4 in the bed-plate.

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It will be seen that from the fact that the central part of the buckle-lever fits closely around the lower part of the mandrel while the upper edges are being compressed upon the ribs m^2, said part m of the mandrel serves to support the lever against the downward thrust of the upper part, o, of the dies O O, thus insuring the proper formation of the said upper parts of the lever.

In order to prevent the blanks from telescoping or sliding past one another upon the mandrel as they are pushed forward by the end i of the carrier, I employ springs N^2 O′, interposed between the outer ends of the dies and the levers P P, these springs acting to press the dies firmly against the blanks upon the mandrel during a portion of the movement of the levers P P outward, thus permitting the dies to yield sufficiently to allow the blanks to be advanced upon the mandrel.

If, from any cause, the carrier fails to push the blanks upon the mandrel properly, or if any other irregularity in the movement of the blanks occurs in such manner as to interpose any unusual resistance to the forward movement of the carrier, the loop G′ will swing upon its pivot g^2, thus allowing the lower end of the lever to advance without moving the carrier, the position of the loop relative to the lever under these circumstances being shown in dotted lines, Fig. 13, the result being that upon the backward movement of the lower end of lever G the lower end of the loop will engage with the tripping-bar K k and disconnect the driving-shaft from its actuating power, thus stopping the machine and avoiding any injury to parts which would be likely to result from the machine continuing in motion after an irregularity in its operation had occurred.

Referring to Fig. 6 it will be understood that the wedging-tongue n^2 supports the lower end of the part u of the lever firmly while the dies N N′ are compressing the metal upon the mandrel; but owing to the wedge shape of this tongue, when the die N is withdrawn from

the mandrel the blank is released from upward pressure against the mandrel, so that it can be readily fed forward to the dies O O.

In Fig. 13 I have shown a construction in which the metal ribbon, instead of being fed to the machine upon a line at right angles to the carrier I *i i'* and the mandrel, is fed upon a line substantially parallel to the path traveled by the carrier, the ribbon, in this instance, passing through the loop G' and under the clamp E' of the feeding mechanism. By an examination of this Fig. 13, which is a modification of the machine represented in Figs. 1, 2, 3, 11, and 12, it will be seen that the position of the dies *c* and c^2 have been changed to correspond with this change in the direction of feeding the ribbon, so that as the ribbon is fed forward by successive impulses the dies *c c* punch holes in the blank, and then the die c^2 punches the blank from the ribbon, and the skeleton which is left after the blanks have been punched passes over the bar *l*, which carries the folder l^2, the pusher-pin c^3 being so located as to pass through the open places in the ribbon-skeleton from which the blanks are passed. The skeleton passes over the mandrel M and down through the opening a^4 in the bed-plate.

It will be understood that the machines represented in Figs. 1, 2, 3, 4, and 12, and in Fig. 13, are alike in all substantial respects, except that in Figs. 1, 2, 3, 4, and 12 the ribbon or strip of metal is fed to the machine upon a line at right angles to the path of the carrier and the mandrel, whereas in Fig. 13, which represents a modification of the machine represented in Figs. 1, 2, 3, 11, and 12, the ribbon is fed in upon a line substantially parallel to the vertical plane of the mandrel.

By an examination of Figs. 6, 14, and 15 it will be seen that the buckle-lever is adapted to be used upon a buckle-frame constructed of two side bars, V (one only being shown in Fig. 15), the side bars being tied together by two end bars, *v' v²*, and a central bar, *v*, the lever being mounted upon the central bar, *v*, by means of the central groove or seat, u^2 w^3, the groove u^2 being of greater depth than the groove u^3 upon the opposite side of the lever, the lip or bit *u* of the lever being arranged upon a line not radial to the center of the groove or seat, but tangential thereto.

The object in forming the lever with the groove eccentric thereto—that is to say, with the groove u^2 deeper than the groove u^3—is to insure that the central bar, *v*, of the buckle-frame shall not spread the sheet of metal of which the lip or bit *u* is made when the straps which the buckle unites are under tension. In Fig. 15 I have illustrated this feature of my invention as follows: W^1 is a strap attached to the open or forked end of the buckle-lever. W is another strap passing inside the end bar *v'*, thence around the end of the bit or lip of the lever, thence under the end bar, v^2, of the buckle-frame, the direction of pull upon the straps being indicated by the arrows; and from an examination of this figure it will be readily seen that, in consequence of the bar *v* being seated in the deep groove u^2 of the lever, the tension or draft upon the straps has but little tendency to spread the lever at the lip or bit *u*. I have also found that by forming the lip or bit *u* of the lever upon a line

tangential to the opening which receives the central bar, *v*, of the frame I am enabled to gripe the strap W more firmly upon the bar *v'* than could be done were the lip *u* formed upon a line radial to the central bar *v*.

Having thus described my invention, what I claim is—

1. In a machine for making buckle-levers the combination
20 of the mandrel M, provided with the ribs *m* m^3 of the dies N N′ O O, and a support, which presses the part *u* of the lever against the rib *m*, substantially as set forth.

2. In a machine for making buckle-levers, the combination, with the die which punches blanks from a continuous sheet of metal, of two or more dies which successively form the metal into the desired shape, and a carrier which moves a blank from the punching-die to the forming-dies and advances the partially-formed lever against the preceding lever, substantially as set forth.

3. In a machine for making buckle-levers, the combination, with the mandrel M, provided with the rib *m*, of the dies N N′ and a stop adapted to engage with the lower end of the lever and determine the length of the bit *u*, substantially as described.

4. In a machine for making buckle-levers, the combination, with the mandrel M, having rib *m*, of the dies N N′ and stops adapted to engage with both ends of the partially-formed lever, to regulate its position relative to the mandrel and dies, substantially as set forth.

5. The herein-described method of manufacturing buckle-levers—that is to say, by bending the blank into **U** shape, then forming the bit *u* and seats u^2 u^3, and subsequently forming the grooves u^4, substantially as herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

LEONARD A. SPRAGUE.

Witnesses:

H. H. DOUBLEDAY.

CHAS. T. DE FOREST.

21 [Endorsed:] Supreme Court U. S. 1887, October term. No. 29. The Smith & Griggs Man'f'g Co., app't, *vs.* Leonard A. Sprague. Stipulation of counsel & addition to record.

[Stamped:] Office Supreme Court U. S. Filed Oct. 11, 1887. James H. McKenney, clerk.

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123-249

FILED
OCT 4 1887
JAMES H. MCKENNEY
CLERK

SUPREME COURT OF THE UNITED STATES.

No. 272.

SMITH & GRIGGS MANUFACTURING COMPANY,

Appellant,

v.

LEONARD A. SPRAGUE.

BRIEF FOR APPELLANT.

Supreme Court of the United States.

[In Equity. No. 272.]

The Smith & Griggs Manufacturing Co.,
Appellant,

against

Leonard A. Sprague.

BRIEF ON BEHALF OF APPELLANT.

I.

Abstract of Case.

This suit was brought in the Circuit Court of the United States for the District of Connecticut on the 5th day of October, 1880, for the alleged infringement of three Letters Patent of the United States, granted to Leonard A. Sprague; one dated May 25, 1880, No. 228,136, the application for which was filed November 11, 1879, for machine for making buckle levers; a second, dated August 17, 1880, No. 231,199, the application for which was filed December 2, 1878, also for machine for making buckle levers; and a third, granted and dated July 20, 1880, No. 230,156, for buckle levers.

No testimony was taken by either the complainant

or the defendant below concerning the last-mentioned Letters Patent No. 230,156.

The bill of complaint was in the usual form with the ordinary prayers for an accounting of profits and damages, a decree therefor, and for a perpetual injunction (p. 4).

The answer of the defendant, among other things, averred that each and all of the improvements patented in said letters patent, were in public use and on sale in this country with the consent and allowance of the patentee for more than two years before his applications for said several letters patent. The answer denied that the defendant had at any time used the said patented inventions or either of them, and denied the infringement with which it was charged in the bill of complaint (p. 10).

The complainant proceeded to make out his *prima facie* case by taking the testimony of an expert, H. H. Doubleday, who testified that a machine which he had seen in the year 1880 in the defendant's establishment infringed the 1st, 3d, 4th and 5th claims of the said Letters Patent No. 228,136, and the five claims of the said Letters Patent No. 231,199, while this machine which had been modified by the defendant thereafter, and which he saw in the year 1881, infringed all of these claims excepting the first one of the said patent No. 228,136.

On behalf of the defendant, the deposition of the patentee, Leonard A. Sprague, and Edmund Jordan were taken, showing public use of machines for profit by the said patentee, in his usual business, for more than two years prior to the application for each of said letters patent, containing the combinations of devices claimed in all but the 5th claim of the patent No. 228,136, and the 1st and 4th claims of the patent No. 231,199, and a deposition was also taken of H. L. Brevoort, an expert, proving that the defendant's machine did not embody what was claimed in these three claims.

After final hearing, his Honor Judge SHIPMAN filed his opinion on the 13th day of July, 1882 (printed at page 78 of the Record), holding that there had been no public use, and that the defendant infringed all the claims of both patents but the second of the patent 228,136, and ordered an interlocutory decree for the complainant, which is printed on page 82 of the record.

The case was then sent to a Master to take an account of profits and damages, who rendered his report (which is printed at page 140 of the record) on the 17th day of March, 1883, in which he reported that the complainant was entitled to ten cents per gross upon the 44,805 gross of buckle levers made upon the defendant's machine, amounting to the sum of $4,480.50, which he found to be the savings or profits due to the complainant. To this report the complainant filed two exceptions on the 13th day of April, 1883, and the defendant filed eleven exceptions on the 17th day of April, 1883, which are printed at page 147 of the record, and which are as follows:

I. For that said Master in his said report found that the savings of the defendants by the use of the infringing machine amounted to the sum of $4,480.50, which is unsupported by and contrary to the evidence, whereas the said Master should have found that such saving was only the sum of $522.72, and no more.

II. For that said Master in his report rejects the testimony of Mr. E. A. Smith, whom he finds "has had large experience in the manufacture of similar brass goods, and whose estimate is probably as good as any off-hand estimate would be," as a mere estimate, and accepts the testimony of the complainant, which is confessedly only an estimate, while it is not shown nor claimed that he has had greater or even as much experience or in anywise more competent to make such estimate.

III. For that said Master in his said report finds that the buckles made by Osborn & Cheesman, in 1878, were inferior to complainant's buckles, whereas his finding should have been solely with reference to the levers, that portion of the buckle made on the infringing machine, but in either case such finding is not supported by the evidence, but is contrary to the same.

IV. For that the said Master in his said report in one place finds from the statement filed by the defendant, and supported by the

testimony of Mr. E. S. Smith, manager of the defendant corporation that the cost of producing leaves on the defendant's infringing machine was 8 and $\frac{8}{10}$ cents per gross, while in another place from the same testimony he finds that it cost $8\frac{1}{2}$ cents per gross, neither of which are supported by the evidence, but are in flat contradiction thereof.

V. For that said Master in his said report finds from the testimony of Mr. Fergus Kelly as to the cost of the Osborn & Cheesman lever, "that an aggregation of the prices stated by him in detail would amount to more than two cents above his first-named cost," which is not supported by the evidence, but is contrary to the same.

VI. For that said Master in his said report finds that the Osborn & Cheesman levers had less work upon them than the complainant's levers, which is not supported by the testimony.

VII. For that said Master in his said report finds that the testimony of the defendant's witnesses is all untrue, because he finds a supposed discrepancy between the witnesses as to the cost of producing levers by old methods, and the return of the defendant and the testimony of its officers, which supposed discrepancy is not supported by the evidence, but is contrary to the same.

VIII. For that said Master in his said report finds that the complainant's patented machine makes a saving of 10 to 12 cents per gross over all old methods, which is not supported by the evidence, but is contrary to the same.

IX. For that said Master in his said report finds that the capacity of the defendant's infringing machine was fully equal to that of the patented machine, which is not supported by the evidence, but contrary to the same.

X. For that said Master in his said report finds that the defendant, by Mr. Smith, its manager, is unable to establish the fact of the cost of producing levers on the infringing machine, which is contrary to the evidence.

XI. For that said Master fails to find in his said report that the cost of producing levers on the infringing machine was two and one-third cents per gross; that the cost of producing such levers by old methods was from two and one-half to three and one-half cents per gross; that the saving to the defendant by using the infringing machine did not exceed one and one-sixth cents per gross, and that the patented machine effected a saving of only three and one-third cents per gross over old methods, all of which is supported by and should have been found from the evidence.

His Honor Judge SHIPMAN, in an opinion (printed at page 148 of the record) overruled the exceptions of both the complainant and the defendant and confirmed

this report. A final decree was entered confirming the Master's report and overruling the exceptions on the part of the complainant and defendant, which is printed at page 149 of the record.

From this final decree the defendant in the Court below appeals to this Court.

II.

The points upon which defendant in the Court below, appellant in this Court, relies are as follows:

FIRST. That the Court erred in holding that no public use by the patentee had been proved for more than two years prior to the applications for the said two Letters Patent No. 228,136 and 231,199 of machines containing all of the alleged improvements described in the said Letters Patent No. 228,136 and claimed in the 1st, 2d, 3d, 4th and 6th claims of the same, and described in the said Letters Patent No. 231,199 and claimed in the 2d, 3d and 5th claims thereof.

SECOND. That the Court erred in holding that the defendant's machine, either as originally used or as afterwards modified, infringed the 5th claim of the said Letters Patent No. 228,136 or the 1st and 4th claims of the said Letters Patent No. 231,199.

THIRD. That the Court erred in overruling the exceptions of the defendant to the Master's report, and in confirming the Master's report, in which he reported that the profits or savings due to the use of the machine as originally used, and as afterwards modified, by

the defendant, were ten cents per gross, amounting to the sum of $4,480.50 upon the 44,805 gross of buckle levers made on that machine.

III.

Public Use.

The proof in the record shows that the improvements described in the Letters Patent No. 228,136 and claimed in the 1st, 2d, 3d, 4th and 6th claims, and the improvements described in the Letters Patent No. 231,199 and claimed in the 2d, 3d and 5th claims were embodied in at least one machine used for profit for more than two years prior to the applications for these letters patent.

The application for the patent 228,136 was filed on the 11th of November 1879, while that for the patent No. 231,199 was filed on the 2d of December 1878, as a division of the application for the former patent, both applications being based on the same model. To simplify the discussion of this question of public use we shall assume that both applications were filed on the 2d of December, 1878, and that the machines described in these two patents are substantially the same in construction and operation as is admitted by the complainant's expert in answer to Q. 4, page 13 of the record, and as is testified to by the defendant's expert in answer to Q. 6, pages 68 and 69 of the record.

The Machine of the Patents.

Before considering the testimony bearing upon this question, it is necessary to an intelligent understanding

of the same, to briefly refer to the construction and operation of the machine described and shown in both of these patents.

This machine is for making what are known as buckle levers, to form part of buckles used almost exclusively on arctic overshoes. One of these levers as completed by the machine is shown in Fig. 9 of the patent 231,199, and is also shown as combined with a buckle frame in Fig. 15 of that patent. These levers are made from a single piece of brass with slots u^1 through them to fasten them to the strap of the shoe, and are bent by formers and swaged by dies so that they have what is termed a lip or bit u which bears upon the holding strap, two grooves u^2 within which lies the bar or pivot v of the buckle and two beads at the upper edge for a finish and to prevent the strap cutting when it is passed through the slots and bears upon the same in use.

There is no claim upon this buckle lever in either of these patents.

The machine is organized to feed a strip of sheet brass under punches, which punch the slots u^1 in the blank and then cut it from the strip; to feed this blank over a matrix where it is bent into U form; to feed it onto a mandrel on which by a pair of dies, it is partially formed, and then along that mandrel to a second pair of dies where its form is completed.

The strip of brass is fed by suitable feeding devices under the punch C shown clearly in Fig. 3, the small punches $c\ c$ first acting to punch the slots u^1 and on the next feeding of the strip the punch c^2 punches the blank from the strip. The blank then drops upon the recessed front of a carrier I, as shown more clearly in Fig. 2, and this carrier moves it over a matrix L, shown most clearly at Fig. 5, when a folder l^2 bends it into U form in the matrix L, one leg snapping under a projection or guide m^3 forming part and an extension of the mandrel M, shown in Fig. 2. The next movement of the

carrier I to carry another blank to be bent into U form, causes the end of that carrier to come in contact with the U-shaped blank in the matrix, and force that blank upon the mandrel M into a position to be acted upon by the first pair of dies N N^1, shown clearly in Fig. 6, where the form of the mandrel M at this point as well as the form and construction of these dies is shown.

It will be noticed that the die N has a piece projecting from it n^2, while the die N^1 has a corresponding recess. This piece n^2 forms a stop or limit to the expansion of the metal in the action of the dies upon it, at the closed end of the blank. These dies form the U-shaped blank into the shape shown in Fig. 8. As the next U-shaped blank, which has been formed while the dies N N^1 have been acting, is moved out of the matrix L, it pushes the blank acted upon by the dies N N^1, along the mandrel M, into position to be acted upon by the second pair of dies O O, shown in Fig. 7. At this part of the mandrel it is provided with ribs m^2 to form with the dies the beads at the open edges of the lever. The action of these dies N N^1 O O with this part of the mandrel finishes the buckle-lever in the form shown in Fig. 9. Each half of the two pair of dies N, N^1, O O is moved positively and all parts of these two pair of dies are moved simultaneously by means of levers P P, shown in Fig. 1, through toggle connections shown in Fig. 13. There are interposed between each of the dies N N^1 O O and the ends of the levers P that move said dies, four springs N^2 N^2 O^1 O^1, more clearly described in Patent No. 228,136 the function of which is to press the dies towards the mandrel after the pressure upon them by the ends of the levers is relieved, and thus prevent any looseness of the parts, and the consequent tendency of one blank to slide over or telescope with the one pushed ahead on the mandrel by it.

As we have shown, the two patents are subdivisions of one application, with claims in each for sub-combi-

nations in the same machine. The machine, just as it is described and shown in both of these patents, with the exception of the springs for press ing the dies forward, to which we have just referred, and, which are only found as elements in the 5th claim of patent 228,136, and with the exception of the rib or guide m^3 which forms an element of the combination of the first claim of patent No. 231,199, and is one of the stops, forming an element of the 4th claim of that patent, it not being in any of the other claims as an element, was in public use by the patentee Sprague from the fall of 1874 to the fall of 1877 without any change or alteration, continuously making buckle levers in his regular busines, to the number of some 50,000 gross or 7,200,000 which were sold.

The only witnesses called to prove this defense are the complainant the inventor and patentee of the machine, and Edmund Jordan.

The First Machines.

Sprague testifies that he obtained a patent on the 27th of May, 1862, No. 35,401, for an improved lever buckle. This buckle consisted of a frame having a lever made of a strip or plate of metal folded back on itself, and bent so that a portion of it encircled the axis of the buckle frame, the free ends of the lever having holes in them through which rivets were passed to secure the leather strap to said lever, the lever and completed buckle being thus similar to that of Fig. 15 of the patent No. 231,199.

He sold buckles with these levers, for several years after 1862, making them in Centre street, New York City, and in Dunham Place, Brooklyn.

Qs. 3 to 6, p. 48 of the Record.

These levers were made by cutting out a blank with the holes for the rivets, in one press, then drawing it

into a U shape in a separate press, and then completing the lever from the U-shaped blank on a mandrel in a third press, independent of the other two.

Qs. 12 to 17, p. 49 of the record.

He continued to make these buckle levers by three separate presses until about the year 1867 or 1868.

Q. 18, p. 49 of the record.

From 1867 or 1868 up to the fall of 1873 he used a machine which made the buckle levers all in one operation. The ribbon of metal was fed into the machine, a blank was cut out with holes punched in the outer ends and then forced over the matrix, where the blank was formed into U shape, when it was forced on to a mandrel and there the lever completed.

Qs. 44 to 50, pp. 51, 52 of the record.

A number of changes were made in this machine prior to the fall of 1873. One was to stop the machine when it worked imperfectly, which was made from one to two years after the machine was constructed.

Qs. 61, 64, p. 53 of the record.

Another change was a friction-joint in the lever, by which we understand he means the lever of the feeding devices, which was made shortly after the machine was constructed.

Qs. 62, 63, p. 53 of the record.

Another was to enable the bead to be put on the lever—meaning, as we understand, the little grooves near the ends of the levers, which was done from 1870 to 1872.

Q. 58, p. 52 of the record.

This machine was constructed and operated substantially as follows, prior to the fall of 1874: It had an automatic feed for feeding the ribbon of metal to the

die for punching out the round holes for the rivets, and the blank.

Qs. 47, 71, 76, pp. 52, 53, 54 of the Record

This automatic feed was substantially the same as that shown at figure 13 of the Patent No. 231,199, it being worked by the motion of the press up and down instead of by a cam on a shaft as in said patent.

Qs. 72 to 76, pp. 53, 54 of the Record.

The dies in this old machine were the same as those in figure 13 of said patent, with the exception that the holes in the dies for punching out the rivet holes were one width of the blank less from the die for cutting out the blank than in said patent.

Qs. 77 to 85, p. 54 of the Record.

This old machine had a carrier for transferring the blank from the place where it was cut out of the ribbon of metal, to a U-shaped matrix where it was bent into U shape the same as in said patent.

Q. 86, p. 54 of the Record.

The U-shaped blank was held in the matrix by a projection on the lower part of the carrier instead of the extension m^3 of the mandrel of the patent, and a portion of the carrier fitted the matrix and drove the U-shaped blank on the mandrel.

Q. 88, p. 55 of the Record.

This mandrel had a rib on its lower portion similar to the rib m in figure 7 of said patent 231,199.

Qs. 94, 95, p. 56 of the Record.

It also had a rib on the mandrel similar to that lettered m^2 in that figure of said patent.

Qs. 96, 97, p. 56 of the Record.

It had dies the same as those lettered $N N^1$ to press the U-shaped blank upon the mandrel into

the form shown in figure 8 of said patent, with the exception that Sprague does not think that this old machine had the wedge-shaped projection n^2 on the lower portion of the die N to support the bite of the lever, and when the die was drawn back, relieve the pressure of the same on the mandrel.

Qs. 89, 90, 91, p. 55 of the Record.

He made buckle levers on this old machine prior to the fall of 1874, substantially the same as that shown at figure 8 of said patent, and sold them to the number of at least thirty or forty thousand gross.

Qs. 100 to 106, pp. 56, 57 of the Record.

He also made in this machine and sold, prior to the fall of 1874, buckle levers the same as shown in figure 9 of said patent, about five thousand gross. In making these he employed with the rib similar to that lettered m^2 of the patent, dies similar to those lettered O O in the patent.

Qs. 107 to 109, p. 57 of the Record.

He had trouble, however, with the making of this kind of buckle lever because of the breaking of the pressing levers, when the blanks were not driven onto the mandrel true.

Q. 98, p. 56 of the Record.

This old machine was used at 41 Centre street, New York City, up to 1869, and then at 18 Dunham Place, Brooklyn, from 1870 to the fall of 1874.

Qs. 132 to 136, pp. 59, 60 of the Record.

It was where people came to sell brass and from the neighboring factories, and to purchase buckles, and they could see it at work prior to December, 1876. No attempt was made to keep the operation of this machine secret, except those whom he thought were

manufacturing buckles were not allowed to inspect it closely.

Qs. 146 to 152, pp. 60, 61 of the Record.

It thus appears that Sprague had, after the experience with the separate machines for cutting and punching out the blank, then forming it into U-shape, and then finishing the buckle lever, made a machine in which all these operations were performed successively and automatically.

This machine did not differ essentially from the one in the Sprague patents, and was as clearly within the scope of the claims of those patents as is defendant's machine.

This machine worked successfully enough to be used for a period of at least three or four years, during which some forty-five thousand gross of buckle levers were made, most of which were sold.

It is true only some five thousand gross of these buckle levers were made with the groove, or bead, as the inventor terms it, at the ends of the lever, and if the machine was defective in any respect it was in the production of these grooves as the last stage of the manufacture of the buckle levers, and may have been, so far as this particular machine is concerned, experimental.

The new machine.

Sprague had, however, experimented, if we may so term it, giving him the benefit of every doubt, with this machine up to the early part of 1874, when, as we shall now show, he began to build a new machine which was the result of his experience with the old machine, and which was to obviate any defects that the old machine had, and which in fact did so obviate them.

Jordan testifies that he was superintendent of the machine shop of Bliss & Williams in 1874, when a machine was ordered by Sprague, January 30, 1874,

which was charged on his books March 21, 1874, when it was probably delivered.

The main portion of this machine was completed when it was delivered, but it left the shop incomplete.

This machine was designed for cutting and forming parts of shoe buckles, and he saw it with the appearance of having been run within a year after Bliss & Williams made it.

pp. 46 to 48 of the Record.

Sprague testifies that he procured a machine from Bliss & Williams the last of April or first of May, 1874, partially completed.

This machine was completed by him and his workmen, and used by him the latter part of the year 1874.

Qs. 20 to 33, pp. 50, 51; Qs. 111 to 114, p. 57 of the Record.

This machine was the same as that described and shown in his patent No. 231,199, with the exception that there were no springs, N^2 O^1, interposed between each die and the levers for working the same. And instead of the rib or guide m^3, as an extension of the mandrel M, the lower side of the carrier had a point for holding the U-shaped blank down in the matrix, the machine being fed with the devices arranged as shown in Fig. 13 of said patent.

Qs. 115, 162, pp. 57 to 61 of the Record.

This machine, so constructed, was used between the fall of 1874 and the fall 1877, at No. 18 Dunham Place, in a room where it could be and was seen in use by persons from neighboring factories, and by persons who came to buy buckle levers and to sell brass.

Qs. 118, 138, 142 to 149, pp. 58, 60 of the Record.

No attempt was made to keep the operation of this machine secret, the only endeavor in this direction be-

ing to prevent parties whom it was thought manufactured buckles from seeing it closely.

Qs. 146 to 152, pp. 60, 61 of the Record.

During this period of time he had in his employ a number of workmen.

Q. 165, p. 62 of the Record.

E. S. Smith, the treasurer of the defendant, testifies he saw a machine a number of years before it began the making of such levers, at Mr. Sprague's shop (Qs. 65, 66, p. 91 of the Record), and told Mr. Lines, his superintendent, who directed the building of the defendant's machine, the kind of machine he saw in Mr. Sprague's shop in 1874.

x-Qs. 80, 81, p. 92 of the Record.

The defendant's machine was made in the year 1879.

Page 86 of the Record.

Mr. Sprague also testifies (Qs. 260, 261, p. 107 of the Record), that Mr. Smith was in his shop about the year 1874.

He made, by the use of this machine, and sold about 50,000 gross of buckle levers, the same as Fig. 9 of his patent No. 239,199, from 10,000 to 15,000 gross being made and sold during the year 1875, and about 8,000 to 10,000 gross during the year 1876, prior to December, some of these being sold at No. 18 Dunham Place, and some at the office at New York, where the orders were taken.

Qs. 118 to 121, 122 to 124, 153 to 155, pp. 58–59–61 of the Record.

The previous trials with the old machine, to produce buckle levers like the one shown in Fig. 9 of the Sprague Patent No. 231,199, and the beginning of an entirely new machine, shows that the experiments on the old machine had ended in overcoming any difficul-

ties in making an automatic machine that would make buckle-levers like the one of Fig. 9.

The new machine, a greater portion of which was made by Bliss & Williams prior to April, 1874, which was completed in the fall of 1874, a period of over six months being consumed by Sprague in finishing the machine to his satisfaction, was used *without any alteration* between the *fall or latter part of 1874 and the fall of 1877*, for profit, some fifty thousand gross or over seven million buckle-levers, the same as Fig. 9 of the Sprague Patent No. 231,199 being made on it and sold.

In the fall of 1877 he introduced the springs between the levers and the dies.

Q. 116, p. 58 of the Record.

We understand from his cross-examination that this was for the purpose of preventing telescoping as the blanks forced each other in succession on the mandrel.

x-Qs. 172 to 174, p. 62 of the Record.

This telescoping would break the mandrel sometimes and choke up the machine, causing it to be stopped, when the blanks were drawn off by a pointed steel and hook.

x-Qs. 188, 189, p. 64 of the Record.

In January or February, 1878, the rib or guide m^3, on the mandrel M was employed instead of the point on the lower side of the carrier.

Q. 117, p. 58 of the Record.

This, in his cross-examination, if we understand him correctly, obviated a trouble of the U-shaped blanks going on the mandrel, so that the beads or grooves in the ends of the lever were not parallel,

one point of the lever being a little longer than the other.

x-Qs. 176 to 179, pp. 62, 63 of the Record.

On his re-direct examination it appears that after these slight alterations were made in the machine, he still had trouble with telescoping, and the machine was injured as before when it occurred, and he still had trouble with putting the bead on, although not so much as he had before.

Re-Qs. 190 to 194, p 64 of the Record.

He was unable to tell how many buckle levers he lost between the fall of 1874 and the fall of 1877 even approximately, and was unable to state that it even amounted to 1,000 gross.

Re-Qs. 195 to 199, p. 64 of the Record.

Nor was he able to tell how many he lost after February, 1878, due to failure to properly bead, and to telescoping.

Re-Qs. 200, 201, pp. 64, 65 of the Record.

It will undoubtedly be argued here, as it was argued below on behalf of the patentee, and which argument the Court below followed, that this machine was used for the purpose of experiment and testing it, and only incidentally for profit, between the fall of 1874 and the fall of 1877, and that the addition of the springs between the dies and the levers, at that time, and of the rib or guide m^3 in January or February, 1878, was the result of these experiments and tests of the machine, when it worked sufficiently to the satisfaction of Sprague for him to apply for letters patent upon it.

There is no proof in this record that supports any such argument.

It must be remembered that the complainant was an adverse witness when the defendant was compelled to call and force from him the testimony which he has

given. It was, of course, to be expected that he would testify to all facts tending to support this view if it were the fact that this machine was built and used to test and improve it, and if any experiments or any changes or alterations in the machine had been made between the fall of 1874 and the fall of 1877 he would have clearly testified regarding the same. All he says, however, upon this subject is in answer to x-Q. 175 (p. 62 of the record), where, after he had testified regarding the difficulty of telescoping which he had experienced, he was asked :

x-Int. 175. Did you experiment from time to time to devise means to prevent it?
A. Yes.

There is nothing to show that these experiments were made prior to the fall of 1877, and he is entirely silent as to what, if any, they were, and what, if anything, was done by him by way of experimenting. As the record stands this machine was not changed or altered, nor was any experiment made with it or on it, during the period of some three years while it made over 7,000,000 buckle levers, which were sold.

Sprague does not intimate anywhere that he made any experiments to overcome the objection which he said existed in the guiding of the U blanks upon the mandril, at any time before he added to the mandril an ordinary guide or rib m^3, which was in January or February, 1878.

The only testimony as to his intention of patenting the machine while experimenting, is his answer to x-Q. 183 (p. 63 of the record), as follows :

183 x-Int. State whether or not it was your intention while you were experimenting upon and improving this last machine to obtain a patent when it should be completed?
A. It was.

There is nothing to show from this answer that it was his intention while he was using this machine for

three years prior to the fall of 1877 to obtain a patent upon it.

The patent which Sprague had obtained on the 27th of May, 1862, covered the lever produced by the patented machine, as shown by the testimony of Mr. E. S. Smith on the accounting Q. 63, p. 91 of the record), and by the fact that Sprague stamped upon the levers made on this machine that was in public use prior to the fall of 1877 the word "Pat" and "1862" as appears by his answers to (Q. 24, 25, p. 50 of the record, and by his answer to Re-x-Q. 304, p. 111 of the record.

As stated by the Master in his report at page 144 of the record, referring to the levers made by this machine,

> "It was a production having a very limited demand, and com plainant, by reason of his previous patent, had come to supply all that demand, and he had the facilities to continue to supply it. Not an Arctic shoe buckle was on the market from any other source."

De Forrest, Sprague's salesman and cashier, testifies concerning buckles containing the lever made by the patented machine in answer to Q. 95 (p. 94 of the record) that:

> "The Arctic shoe manufacture is confined to about a dozen firms, and they are the only parties that use the Arctic buckle."

He further testifies that no one was making these buckle levers by any method when the defendants began to use their machine (Q. 102, p. 94 of the Record), nor were they made or sold by anybody outside of the complainant's shop to his knowledge (Q. 104, same page).

Sprague testifies in answer to Q. 243, p. 105, that he had facilities for supplying the entire market demand for these levers during the period the defendant made them from 1879, and this, although he had but the one machine, which he had used from the fall of 1874, as appears from his answers to Qs. 156, 157, p. 61 of the record.

It is thus clear that this one machine was capable of and did produce all the buckle levers for which there was any demand in the market between the fall of 1874 and the fall of 1877, it being used all that time making all the levers that could be sold, and bringing to Sprague all the advantages of being then able to supply the market. It was therefore not a machine that it could possibly have been profitable to make and sell. This machine was not made for the purpose of testing its operation or perfecting it. Sprague had made many experiments and alterations in his old machine, which had resulted in the building of this one. It was not a machine that required a great length of time to determine whether it would work satisfactorily or not. Any slight defects that it had must have been apparent on the first day's use of it, and the fact that he continued to use it for three years without any change or alteration, making on it and selling the enormous number of over 7,000,000 buckle levers, negatives the idea that he used it during that period of time for the purpose of testing it to discover its defects or to remedy them. It was not like a machine or a process or an article that required long trials under various conditions to determine whether it would work or not; but it was like any machine made for the purpose of manufacturing an article and used in the ordinary business of the person making it, to produce all such articles for which there was any market, not working always to the entire satisfaction of its maker, capable of improvement as any automatic machine always is no matter how ingeniously made, and which was still capable of improvement even after the springs and the guide were added, because after the patents were applied for, he still further improved it by adding an adjustable face for the matrix for making the U blank, as is shown by his answer to Q. 158, p. 61 of the record.

The public use of this machine for three years is, therefore, different from those cases like that of the

City of Elizabeth vs. the Pavement Co. (97 U. S., p. 126), where long trial, on account of the peculiar character of the invention, was necessary to determine whether it would be successful or required further improvement for the particular purpose.

It is to be observed in considering this question, that about the time the addition of the guide and the springs were made to this machine, the patent granted to Sprague May 27, 1862, was about expiring, and the inference is very strong that, becoming aware of this fact, and knowing that he had used his machine for more than two years, he set to work experimenting in the fall of the year 1877 to make alterations in it, which he did, and which, as stated by the Court below, "are apparently not of great importance," hoping thus to avoid the consequences of his having used the machine for more than two years where the public could and did see it prior to his application.

It would, indeed, be a dangerous practice to sanction the public use by an inventor of a machine for profit for so many years before he made his application for a patent, as in this case, without any change or alteration during such use, and then, by such slight additions as in this case, be able to avoid the consequences of such public use. If an inventor could do this there would be almost no limit to the prolongation of his monopoly, because he could continue to make changes year after year, and finally, after obtaining his patent, successfully suppress the use of machines constructed according to the one he had so publicly used, and which had been made by other persons through knowledge derived from such public use, as is the case of the defendant herein, as we have already shown. Such changes or alterations would be, as stated by Judge LOWELL in the case of Perkins vs. Nashua Card and Glazed Paper Co., 2 Fed. Rep., 457, "to benefit the patent rather than the machine."

Assuming that instead of obtaining only two patents

as divisions of one application, each with claims for different sub-combinations in the same machine, as Sprague did in the present case, he had obtained three patents as divisions of one application—in one of which he showed the entire machine with the springs between the dies and the levers, and with the rib or guide m^3, and made in that patent claim 5 of the patent 228,136, and the 1st and 4th claims of the patent 231,199, and had in the other two patents left out this rib and these springs and made the other claims that appear in these two patents—certainly in such case he would not under the circumstances to which we have referred be able to escape the charge that his invention had been in public use in contemplation of law for more than two years prior to his application, and such public use should have no different effect upon his present patents.

We confidently contend, therefore, that as this machine was used by Sprague for more than two years prior to his application for the patents in suit, the 1st, 2d, 3d, 4th and 6th claims of the patent 228,136 and the 2d, 3d and 5th claims of the patent 231,199, covering inventions embodied in and carried out by it while so publicly used, are void in view of the considerations we have presented and the decisions cited below.

Consolidated Fruit Jar Co. vs. Wright, 94 U. S., 92.
Egbert vs. Lippman, 104 U. S., 333.
Worley vs. Tobacco Co., 104 U. S., 340.
Manning vs. Cape Ann Isinglass Co., 108 U. S., 462.
Henry vs. Francestown Soapstone Stove Co., 2 Fed. Rep., 78.
Henry vs. Providence Tool Co., 14 O. G., 855.
Perkins vs. Nashua Card and Glazed Paper Co., 2 Fed. Rep., 451.
American Hide and Leather Splitting Co. vs. American Tool and Machine Co., 4 Fish., 284.
Lyman vs. Maypole, 19 Fed. Rep., 735.

IV.

Infringement.

In view of our previous discussion it will be only necessary upon the question of infringement to consider whether the defendant's machine infringes the 5th claim of the Sprague patent 228,136, or the 1st and 4th claims of the Sprague patent No. 221,199.

The machine as originally made by the defendants and used in September, 1879, is illustrated in diagrams 1*a*, 3*a*, 4*a*, 5*a*, 6*a*, 8*a* and 10*a*, pages 31 to 36 of the record. As shown in Fig. 1*a*, after the blank has had the slots punched in it and cut off from the strip, a carrier i^1 advances it over an opening through which it is bent by a bender l^2, and forced into a holder L, as shown at Fig. 1*a* and Fig. 3*a*, its free edges snapping under little projections at the upper part of said holder lettered m^3, to retain it in said holder. This holder is then revolved a quarter turn by a rack and pinion, as shown in Fig. 4*a*, when the U blank is forced by another and separate carrier onto a mandrel M lying horizontally, as shown in Fig. 5*a*. This mandrel is pivoted at m^4 so that it can rise and fall, and as first used a spring marked N^2, O^1, shown in Fig. 8*a*, pressed against the end of a lever connected to the mandrel, pressing it against the lower stationary dies N, O. The U-shaped blank when it is in a position over one of the stationary dies N has its closed edge against a projection at the left hand of said die, its open end being held down by a catch marked m^3, which is forced towards the die by a spring. The other half of this die which is marked N^1 then descends forcing back the catch by an incline on its edge coming in contact with an incline on the catch, and presses the blank and with it the mandrel towards the lower die N, and the lever is thus formed into the shape

shown in Fig. 7*a*. This partially formed lever is then advanced by another U-shaped blank moved against it, along the mandrel between two dies O O, the lower of which is stationary, while the upper is movable. At this place on the mandrel are small ribs m^2 to form the beads. This machine was afterwards altered by dispensing with the pair of dies O O, and changing the contour of the dies N N^1, so that they would complete the lever at one operation without the use of a second set of dies; and after this change was made, the spring marked N^2 O^1, in Fig. 8a, placed under the end of the projection from the lever which supported the mandrel was removed.

Qs. 4, 5, page 78 of the record.

The 5th claim of the patent 228,136 is as follows:

"5. In a machine for making buckle levers, the combination of a mandrel M and dies N N^1, of the springs N^2 N^2, to press the dies forward into proper position relative to the mandrel, substantially as set forth."

As stated by defendant's expert, Mr. Brevoort, after referring to the operation described in the patent to avoid telescoping, at page 68 of the record:

"In the machine described in the patent to do this work effectively, two springs are necessary, one for each half of the die; or, in other words, one to keep the buckle lever against the mandrel on one side, and one to keep it against the mandrel on the other side, and, I think, from the specification of the patent, and from the terms of the claim, that the invention therein referred to is limited to the use of two movable dies and two springs arranged as described and shown in the patent."

The lower die in the defendant's machine is rigid and immovable, while the upper die is moved positively towards it, and no spring is interposed either between the support for the lower die and that die or between the upper die and the device that moves it.

It is therefore plain that there is no spring or springs like those in the patent No. 231,199, marked N^2 N^2 to press the dies toward the mandrel.

When the defendant's expert Mr. Brevoort examined the defendant's machine it did not have the spring marked N^2 O^1 to hold the mandrel against the lower dies, in it, but he testifies that assuming it to be in the machine as shown in the drawing Fig. 8^a, that such machine would not contain the invention embodied in the fifth claim of this patent, because such spring did not act upon the dies, it was not the equivalent of the two springs referred to in the claim, and was a substantially different construction and a new method of reaching a result reached in a substantially different way by Sprague (see his answer to Q. 7, p. 70 of the record).

The complainant's expert, however, is of the opinion that this spring N^2 O^2 shown in Fig. 8^a which tends to hold the mandrel M towards the dies N^1 O is the equivalent of the two springs for holding the two parts of the dies N N^1 towards the mandrel in the Sprague patent.

Even if the spring in the defendant's machine operating upon the mandrel performs the result performed by the two springs operating to press the dies forward towards the mandrel, as in the patent, the combination and arrangement of the parts being so radically different from that of the patent it cannot justly be said to come within the scope of the fifth claim.

That, however, this spring as used in the defendant's machine did not accomplish the result of the springs of the patent, is shown by the fact, that it was removed from this machine in January, 1882, and nothing was put in its place, but yet there was no more tendency of the blanks to telescope than when it was used, and its removal had no effect upon the practical operation of the machine, as proved by the deposition of the defendant's workman Lawton in answer to Qs. 4 and 10, p. 78 of the record.

Defendant's expert, Mr. Brevoort, testifies that the machine without the spring to hold the mandrel down does not contain the invention of the fifth claim of the

patent, because of the absence of such spring and any equivalent for the springs of the patent (see Q. 5, p. 66 of the Record).

There is no contention upon the part of the complainant's expert that the machine without the spring infringes the fifth claim of the patent.

It is clear from these considerations that as the machine as originally used by the defendant did not have any springs interposed between movable dies and the devices for moving the same, but had a different arrangement of devices which enabled it to work successfully, the mandrel being pivoted and being in relation to a fixed die, and that the spring that was used to press this mandrel towards that die did not operate to prevent telescoping, as shown by the fact that the machine worked as well without it as with it, the defendant's machine did not contain the invention of this fifth claim.

The 1st claim of the patent 231,199 is as follows :

"In a machine for making buckle levers, the combination of the mandrel M, provided with the ribs m m^3, of the dies N N^1, O O, and a support which presses the part u of the lever against the rib m, substantially as set forth."

Complainant's expert testifies that the support referred to in the first claim of the Sprague patent, No. 231,199, is the part marked n^2 in said patent.

p. 25, fol. 51 of the Record.

He further testifies :

"The defendant's dies do not have anything which correspond to or are the equivalent of the recess n^1 or the wedge-shaped tongue n^2 shown in the Sprague patents."

p. 23, fol. 47 of the Record.

In view of this testimony it would seem hardly necessary to enter into a discussion of any other evidence given by complainant's expert on the question of the infringement of the first claim of the

patent No. 231,199, as the machine differed from it as originally used by not having the recess n^1 or the wedged shaped tongue n^2, and further differed as modified in having one pair of dies instead of two.

This expert, however, if we understand him correctly, is of the opinion, notwithstanding the statements referred to by us as made by him, that the defendant's machine with only one pair of dies infringed the said first claim.

When first asked the question as to whether the first form of defendant's machine infringed the said first claim he says nothing about finding in said machine, the mandrel M provided with ribs m, m^3 (p. 25, fol. 51 of the record).

When he afterward produced drawings of defendant's machine he marked the two inward projections in the swinging holder, L, lettered at Fig. 3a of Doubleday drawing No. 2, m^3, and the rib on one of the dies, N, of defendant's machine, lettered at Fig. 5a, m^3.

There is no positive testimony by him that the ribs, m^3, on the swinging holder, and the catch m^3, working with the die, N, are substantially the same as the rib, m^3, on the mandrel, M, of the first claim.

They are not on and form no part of the mandrel of defendant's machine ; and they are entirely independent of such mandrel in construction and operation.

There is nothing in the defendant's machine which corresponds with the rib m^3 of the first claim, or is equivalent to it, or which performs the same function. When the U-shaped blank in the defendant's machine leaves the holder L, and passes therefrom into the opening or tunnel in the part D, as shown at Fig. 1a, it there first engages with the mandrel, the two legs of the U-shaped blank being compressed toward each other in the tunnel, it is pushed upon the pointed end of the mandrel and binds closely upon the edge of the mandrel nearest the folded end of the blank, so that it cannot slip closer to that edge of the mandrel. Then the

movable catch m^3 shown at the right in Fig. 5*a* of said drawing holds the blank after it passes from the tunnel under the forming die in the same position as when it first passed on to the mandrel when in the tunnel, so far as relates to the compressing of the legs together and causing the blank to bind on the mandrel.

In the patent No. 231,199, the part n^2, which complainant's expert, as we have before shown, regards as the support referred to in the first claim, is described at page 2, lines 118, 119 and 120, as follows:

"The die N is provided with a wedge-shaped tongue n^2 which enters the recess n^1."

At p. 4, lines 44 to 53, inclusive, it says:

"Referring to Fig. 6, it will be understood that the wedging tongue n^2 supports the lower end of the part u of the lever firmly, while the dies N N^1 are compressing the metal upon the mandrel; but owing to the wedge-shape of this tongue, when the die N is withdrawn from the mandrel the blank is released from upward pressure against the mandrel so that it can be readily fed forward to the dies O, O."

Complainant's expert seems to think that the little rib marked n^2, at Figs. 5*a* 6*a* and at 8*a* forming a part of the lower die of defendant's machine, is the same as the support n^2 of the Sprague patent.

This part in defendant's machine is not wedge-shaped and is fixed in relation to the die. It is stationary and rigid and can have no movement, and it never is moved to release the pressure of the blank against the mandrel, so that the blank can be readily fed onward. As it has neither the construction nor operation of the part n^2 of the patent it cannot be held to be substantially the same.

Complainant's expert testifies, that the machine as modified contains the inventions of said first claim, for although the two pairs of dies, N, N^1, O, O, are enumerated specifically in said claim, which operate successively upon the U-shaped blank, the first pair forming the bit u and the seat groove u^2

u^3, and the dies O O forming the grooves at the open ends of the buckle lever, while only one pair of dies is employed for doing all of this work in defendant's machine, still as this one pair performs the same result, it is the same as the two pair of the claim.

pp. 36, 37, fols. 73–74 of the Record.

It will be observed that the dies N N^1 and O O, as described and shown in the Sprague patent, No. 231-199, can never operate on one blank simultaneously, or as if in effect they constituted one pair of dies. They are so constructed and arranged that they always must operate on two blanks, the pair N N^1, shaping one portion of the U-shaped blank, and the pair O O another portion. There is no suggestion in the patent that one pair of dies would be the equivalent of the two pair, nor that the machine could be modified in any way so that one pair could take the place of the two pair. In the defendants' machine as modified but one pair of dies is employed, and they act upon and finish the buckle lever without the employment of a second pair of dies.

It would therefore seem clear that defendant's machine, as modified, does not contain the two pair of dies N N^1, O O of the first claim of the patent No. 231,199.

Defendant's expert Brevoort is of the opinion that defendant's machine, neither as originally used nor as modified, intringes the said claim.

He testifies on this subject at p. 68, Q. 6, p. 70, Q. 8 of the Record, as follows. Regarding the modified form of defendant's machine, without the spring, he says :

"Q 6. Please compare the invention referred to in the first claim of the Sprague patent, No. 231,199, with the machine which you saw in Waterbury, and state whether or not, in your opinion, the said machine contains the invention referred to in the said first claim of the Sprague patent above referred to, and in answering this question please give your reasons for any opinion which you may express?

"A. I have carefully made the comparison called for in the ques-

tion, and it is my opinion that the machine which I saw at Waterbury does not contain the invention referred to in the first claim of the patent No. 231,199. Before I give my reasons for this opinion I will first state what I understand to be the invention referred to in the said first claim.

"The machine described in this patent to Sprague is, in substance, like the machine described in the early patent, to which my attention was called in the last question: and the object of the machine is to produce substantially the same manufacture. For the purposes of this inquiry, however, the two machines can be considered as identical. The first claim of the patent to which my attention is now called relates to the combination with a machine for making buckle levers of the mandrel M, being, as the claim says, 'provided with ribs m m^3.' The combination also includes the first and second pair of forming dies which compress the U-formed blank against the two sides of the mandrel, and result in the completion of a buckle lever only when submitted to the action of both dies. The claim also refers to a support which presses the lower part of the partially formed buckle lever against the lower rib of the mandrel, and which support is only used with the pair of dies marked N N^1, and, consequently, there is no coaction between the support and the dies marked O O, which are the last pair of dies that act upon the buckle lever.

"However this may be, the second pair of dies are made an essential element of the claim.

"The two ribs referred to in the claim, marked m m^3, are used for two purposes. The rib marked m is the rib which is used for the formation of the groove in the buckle lever which is to surround the cross-bar of the buckle frame, and the rib indicated by the letter m^3 in the claim is described as serving to hold the U-formed blank upon the mandrel when the folder, which presses it into the matrix, rises upwards and is withdrawn. This rib, however, is continued along the mandrel, and I suppose is intended to serve as a limit or stop upon one side of the mandrel for one of the folded wings of the buckle lever, although it is doubtful whether in the operation of the machine it performs this function, for the reason that the creasing and folding in of the metal of the buckle lever tends to shorten the buckle lever and draw the folded ends downward and away from the rib m^3.

"However this may be, this rib is made an essential element of the claim, as is also the rib indicated by the letter m.

"The support which is referred to in the claim, and which is made an essential element thereof, is described as follows in the specification of the Sprague patent:

"'Referring to Figure 6 it will be understood that the wedging 'tongue n^2 supports the lower end of the part u of the lever firmly 'while the dies N N^1 are compressing the metal upon the mandrel;

'but owing to the wedge shape of this tongue, when the die N is 'withdrawn from the mandrel the blank is released from upward 'pressure against the mandrel, so that it can readily be fed forward 'to the dies O O.'

"Now, this support, therefore, which is referred to in the claim, is a support which acts only as such while the dies N N^1 are partially completing the folding of the buckle lever, and, from the statement just quoted it is evident that such support must be removed when the partially formed buckle lever is to be fed along the mandrel into the proper position to be subjected to the action of the second pair of folding dies, and so far as the Sprague patent goes, either in its descriptions or its drawings, it would seem that this removing of the support after the action of the dies was essentially necessary to permit the buckle lever to be fed along the mandrel; and consequently, I think the claim is limited to a support which moves out of the way after the dies have acted upon the buckle-lever to partially complete it.

"In the machine which I saw in Waterbury I do not find a mandrel provided with ribs m m^3; neither do I find that that machine possesses any equivalent for the dies O O, which are made an essential element of the first claim; and further, the Waterbury machine does not possess a removable support, which holds the buckle-levers up against the mandrel and is then, after the action of the dies, removed so that the buckle-levers can be fed forward.

"The lower die of the Waterbury machine is provided with two ribs, one on the back and one on the front, which ribs hold the buckle-lever in the proper position longitudinally during its passage over the mandrel. No such ribs and no equivalent therefor are shown or described in the Sprague patent, as applied to the dies. For the reason that the Waterbury machine has not a mandrel provided with the ribs m m^3; for the reason that the Waterbury machine has not got a second pair of dies referred to by the letters O O in the claim, and for the reason that the Waterbury machine has not got the support which is removed after the action of the dies, and which support is referred to in the claim, I am of the opinion that the said Waterbury machine does not contain the invention of the first claim of the Sprague patent No. 231,199.

Regarding the defendant's machine when it had the springs but only one pair of dies he says:

"Q. 8. Please state whether the Waterbury machine would or would not in your opinion contain the invention of the first claim of the patent No. 231,199 if altered by the insertion of a spring as referred to in the last question and as shown in figure 8*b* of the Doubleday Drawing No. 5?

"A. The machine so altered would not contain the invention of the first claim of the patent No. 231,199. It is unnecessary here for

me to recite any reasons, for in the opinion expressed in a previous answer herein I gave at length my reasons why the Waterbury machine did not contain the invention of the claim of the Sprague patent referred to in this question.

"The insertion of a spring under the heel or projection from the mandrel, as shown in figure 8*b* of the Doubleday Drawing No. 5, would not bring the said Waterbury machine within the scope of the said first claim.

Regarding the defendant's machine as originally used he says:

"Q. 9. Referring now to the Sprague Patent No. 231,199 and the invention claimed in the 1st claim thereof, please assume that the Waterbury machine which you saw was altered by the addition of a second set of dies for completing the formation of the buckle lever while it is sliding along the mandrel, substantially as is shown in the Doubleday Drawing, marked Doubleday Drawing No. 1, at Fig 1*a*, and in Doubleday Drawing No. 4 at Fig. 10*a*, in which drawings the upper halves of two dies are shown as formed from one piece of metal?

"A. I have carefully made the comparison called for in the question, and I understand the Doubleday drawings referred to, and the figures therein shown. Even if the Waterbury machine was provided with the equivalents of the dies N N^1 and O O, referred to in the first claim of the Sprague Patent No. 231,199, said machine would not then contain the invention of the said first claim, for the reason that the Waterbury machine would not have a mandrel which mandrel was provided with ribs m m^3, and would not have the support which acts to support the buckle lever when the dies were compressing it upon the mandrel, and which support, after so acting, is withdrawn and ceases to support the buckle lever and permits it to slide along the mandrel so as to be acted upon by a second set of dies—and consequently, for the reason that the Waterbury machine, altered as supposed, would not possess the special mandrel and special support referred to in the first claim; it is my opinion that said altered machine would not contain the invention claimed in the first claim of the patent 231,199."

From the above considerations it clearly appears that the defendant's machine did not infringe the first claim of the Sprague patent No. 231,199, because it did not have either the mandrel M provided with the rib m^3 or the support n^2, of said claim, constructed and operating as those are described and shown in said patent; and that the machine as modified did not in-

fringe said claim for the additional reason that it lacked one of the two pair of dies, N N′, O O, of said claim.

The fourth claim of the patent No. 231,199 is for the same combination of devices as the first claim, with the dies O O left out. The stops referred to in that claim consist of the wedge-shape support n^2 and the rib m^3 of the first claim. The same discussion, therefore, on the question as to whether the defendant's machine infringes the first claim is equally applicable to this claim and need not be repeated.

The entire machine (with the exception of the rib or guide m^3 on the mandrel and the springs N^2 N^2 O O used in connection with the dies) as described and shown in the two Sprague patents was public property at the time the defendant made its machine in September, 1879. The defendant built upon this machine which was public property changing the means for preventing the U-shaped blank from being drawn out of the matrix and for keeping it in proper relation with the mandrel, using devices for this purpose acting merely as guides, differing radically from the projecting rib m^3 of the patent. It also built upon this machine that was public property, by changing the position of the mandrel and the operation of the dies so that the blanks would not telescope, not using springs behind the dies, nor using anything the equivalent of the springs behind them, nor using a spring to move the mandrel towards the lower dies for the purpose of, nor did it operate to prevent telescoping, for when it was removed the machine worked just as well as when it was on. The defendant, therefore, is as free to use its form of improvement upon the old machine that was public property as the complainant is, and the latter is not entitled to invoke the application of any liberal doctrine of equivalents under such circumstances in

view of the rulings of this Court in the case of McCormick vs. Talcott, 20 How., 402, and Railroad Co. vs. Sayles, 97 U. S., 554.

V.

The Accounting.

I.

The interlocutory decree filed July 27th, 1882, found at page 82 of the record, ordered that

"The complainant do recover of the defendant the profits, gains and advantages which the said defendant has received or made, or which have arisen or accrued to it, as well as all damages in excess of profits sustained by the complainant from said infringement of the claims of said patents by the manufacture or use of the machines for making buckle levers containing said improvements, as described and secured by the aforesaid letters patent since the 25th day of May, A. D. 1880."

The decree further ordered that the cause be referred to E. E. Marvin as Master

"to ascertain and take and state and report to the Court an account of the number of said machines for making buckle levers made or used by the said defendant, and of the number of buckle levers made by the defendant thereon, and also the gains, profits and advantages which the said defendant has received, or which have arisen or accrued to him since the 25th day of May, 1880, as well as all damages in excess of profits sustained by the complainant from infringing the said exclusive rights of the said complainant by the manufacture or use of the said letters patent."

The decree further ordered a perpetual injunction to be issued against the defendant restraining it, its agents, etc.,

"from making or selling or using, or in any manner disposing of machines for making buckle levers containing said improvements described in said letters patent."

The Master on the 22d of September, 1882, gave notice to the defendant of a time when he would proceed to take an account of all profits, gains, and advantages arising from the infringement of the claims of the two patents and of all damages in excess of profits sustained by the complainant from said infringement.

"By the manufacture or use of the machines for making buckle levers containing the improvements described and secured by the aforesaid letters patent since the dates of their issue."

The Master also notified the defendant, as a preliminary step in said accounting, to present a statement of all the profits made by the defendant from the aforesaid infringements; of all costs of manufacture; of all avails of sales or other gains by the use of the machines for making buckle levers covered by the said claims of said patents.

On the 9th of October, 1882, the defendant presented a statement admitting the use of but one infringing machine, the first use of which was in September, 1879 (see page 86 of the record). There was no testimony before the Master that the defendant had ever made or used any but this one machine, and there was none that it had ever sold any such machine.

The buckle lever made by this machine is substantially the same as the buckle lever shown at figure 9 of the machine patent, No. 231,199. The patent to Sprague of May 27th, 1862, for the lever buckle to which we have referred had expired before the defendant made its machine.

The public had a perfect right thereafter to manufacture this buckle lever by any of the old and well known methods and devices for manufacturing similar articles.

II.

The law applicable to accounting for infringement of patents, by the use of an infringing machine, we

understand to be as stated by this Court in the case of Whitney vs. Mowry, 14 Wallace, 620, where it says:

"The question to be determined in this case is, what advantage did the defendant derive from using the complainant's invention over what he had in using other processes then open to the public, and adequate to enable him to obtain an equally beneficial result? The fruits of that advantage are his profits."

Black vs. Thorne, 111 U. S., 122.
Cawood Patent, 94 U. S., 695.
Livingston vs. Woodruff, 15 How, 546.

A reference to the decree and the notice of the Master made thereunder, clearly shows that they were drawn with this rule of law in view, and that all the Master was called upon to do was to take testimony and make his report regarding the savings accruing to the defendant by the use of the single machine for making buckle levers that contained the improvements covered by the specified claims of the machine patents 228, 136, 199 and 231.

The rule of law above referred to, the Master in his report adopts as governing this accounting as follows:

"I do find as matters of law in such cases, and in this case, that only such savings of labor as the defendant saved by the employment of the complainant's patented device, over and above what their cost would be produced by any other efficient method open for him to use in the production of these buckles, is properly recoverable in this case as profits."

Page 141 of the record.

"All the complainant was entitled to in the matter beyond others was that his increased facility for making them (buckle levers) by means of his patented machine should remain sacred to him. The one act, therefore, of the defendant of seizing upon the complainant's device in this respect, to accomplish therewith what he could have rightly employed any other well-known means to accomplish, has only subjected him to such savings in the work as he has thereby made."

Page 145 of the record.

The Master finds that the defendant saved by the use of complainant's invention in the manufacture of 44,805 gross of buckle levers, the number made by the

defendant's machine, the sum of $4,480.50, which he thinks should be repaid to the complainant as savings or profits in this case.

In every step which the Master has taken in arriving at this result he is in error.

III.

9TH EXCEPTION.

For that said Master in his said report finds that the capacity of the defendant's infringing machine was fully equal to that of the patented machine, which is not supported by the evidence, but contrary to the same.

The Master concludes that because the machines were found by the decision of the Court below to be substantially alike that—

"The defendent saved as much by the employment of its automatic machine as did the complainant by the employment of the patented machine as compared with any other process then known and open to all, and adequate to accomplish the work successfully."

And assumes that—

"The saving of the defendant in the production of these buckles to have been the same by the employment of the infringing machine, that the complainant saved in the employment of the patented machine as against any other known and open method."

Page 143 of the Record.

The defendant's machine, both as first used and as afterwards modified, was not an exact copy of the machine of the complainant's patent, but differed therefrom in many particulars, about which considerable expert testimony was taken, but which the Court below held were not substantial differences for the purpose of constituting the machine an infringement of the claims in controversy. Although, therefore, the machine was held to infringe these patents, no conclusion could be drawn from such decision, that it

would either operate as well or better or worse than the machine just as it is shown in the complainant's patent. No presumption of any kind upon this question can arise from the decision.

It seems to be largely upon the strength of this decision that the Master arrives at the conclusion that the defendant's machine would be as economical in its working as that of the complainant's patent.

As a matter of fact the infringing machine would not do as much work in a given time as that of the complainant.

Lawton, a machinist in the employ of the defendant, who had charge of the infringing machine both in running and repairing the same, when called by the complainant, testified on this subject as follows, at pages 100, 101 of the record :

"Int. 174. How many buckle levers have you ever made in a day upon the machine enjoined; I mean the largest amount?

"A. About 150 gross.

"Int. 180. What made you give 150 gross per day as the highest?

"A. It was the highest I ever cut.

"Int 181. In how many hours was that done?

"A. Ten hours."

The complainant Sprague testifies in answer to cross-question 267, page 107 of the record, that he ran his machine a week and made 1,720 gross. This would be at the rate of $286\frac{2}{3}$ gross a day.

No other witnesses are called to show the capacity of either machine than Lawton and Sprague.

The Master says regarding this testimony :

"Lawton, indeed, says that the defendant's automatic machine did not make over 150 gross of buckle levers a day, while the complainant's would make 285 gross per day; but then, on cross-examination, he admits it was never run over half a day at a time, which would prove its capacity to be fully equal to that of the complainant's patented machine."

Page 143 of the Record.

There is no answer of Lawton on cross-examination that refers to this subject at all. The only answer,

other than the one we have given, relating to the capacity of the machine in this connection, is the one he gives on his direct examination to question 182, page 101 of the record, where he is asked whether the machine ran constantly during the ten hours that he had just stated that it ran in a day to produce 150 gross, and his answer is :

" Well, not all the while, it never did."

From the testimony of Lawton it can be reasonably inferred that the machine ran practically during the ten hours of the day, with the exception of such stops as were incident to delays of any automatic machine working on metal, because the 150 gross was the highest amount ever made on it, that he knew of, in one day. At all events, there is no inference such as the Master has drawn that it only ran half a day in producing 150 gross, and that therefore its production was equal to that of the Sprague machine of 285 gross a day.

The fact is, as shown by the evidence, and we have referred to all that bears directly on the subject, that the infringing machine was not capable of producing much more than one-half the number of buckle levers that the machine shown in complainant's patents produced, on account of the differences in construction before referred to.

The conclusion, therefore, of the Master, that because this machine was held to infringe the complainants, patents, and his other conclusions based on an erroneous statement or understanding of the testimony, that this machine could produce as many buckle levers a day as the machine of the complainant's patents, was erroneous.

8TH EXCEPTION.

For that said Master in his said report finds that the complainant's patented machine makes a saving of 10 to

12 cents per gross over all other methods, which is not supported by the evidence, but is contrary to the same.

The next erroneous step that the Master takes in arriving at the amount of profits of $4,480.50 is also unsupported by the testimony and forms the basis for the 8th exception. In his report he says :

"The complainant proves that his machine saved ten or twelve cents a gross over the old methods, and that defendant's machine, if like it, must have saved as much."

p. 143 of the Record.

And again he says :

"The complainant puts this saving at ten or twelve cents a gross, and supports the statement with the report of a certain test and considerable detail."

p. 142 of the Record.

It appears in the testimony of Lawton that after the decree in this case and the injunction, the defendant altered its machine so that the blank was cut and formed into shape in one machine, and was then taken by hand to another machine operated by foot power, where it was completed by dies (Qs. 147 to 153, pp. 98, 99 of the Record). All the testimony upon which the Master bases these findings is that of Sprague, and it is as follows (found at p. 106 to 110 of the Record) :

"Int. 252. From your experience as a manufacturer of buckle levers, what advantage would there be in making them in the way in which they were making them before enjoined and the way testified to as the present method? I mean what difference in cost per gross?

"A. I never saw their machine, and therefore do not know what it would cost on that to make them.

"Int. 253. What difference would there be between the cost of production on your own machine and the cost in the way now practiced by the defendant?

"A. I should think some ten or twelve cents. It may not be quite as high as that; I could not tell. I could see the machine in favor of my machine; that or my machine would do it so much less."

"256 Int. You gave as the difference in cost between making buckle levers on your complete machine and defendants' present way as ten or twelve cents per gross. Would there be substantially the same difference between defendants' present way and the way formerly practiced by them on the infringing machine?

"A. From information I should think not. I don't know their machine.

"257 Int. Can you give no statement as to what the difference would be?

"A. I don't think I could.

"258 Int. Give an approximate statement as nearly as you can?

"A. Between their first machine, as I have heard it described, nearly as much as mine."

On cross-examination he further testifies:

"290 Cross-Int. Did I understand you correctly as saying that it cost the defendants ten or twelve (cents) per gross more to produce buckle levers on the infringing machine than it did on your patented machine?

"A. I did not understand it so. I had reference to your present hand machine, as you call it.

"291 Cross-Int. Upon what do you base your estimate as to the costs to them by their present method?

"A. The amount of labor that there would be to do it in that way.

"292 Cross-Int. Have you made any careful computation as to the costs of them by their press method?

"A. No more only what it would cost me to do it by doing similar work that I had done.

"293 Cross-Int. To what similar work do you refer?

"A. Drawing up fasteners for stair-rods; you have to pick up and put into the machine and pick out, and the quantity you turn out in a day.

"294 Cross-Int. Have you a sample of those fasteners with you; if not, please describe their shape and method of construction?

"A. I have no sample here. I have them at home. There was a flat piece of metal; blanks were punched out of the required size; I put it under the foot press between dies and formed it, then struck it and then picked it out of the die by hand.

"295 Cross-Int. And it is upon the cost to you for producing this kind of work that you have made your estimates as to the cost to the defendants for producing levers by their present process, is it not?

"A. Yes, sir.

"296 Cross-Int. And the result of that estimate is that it costs the defendants ten or twelve cents per gross more to produce levers

by their present processes than it does you on your patented machine, does it not?

"A. Yes, sir; I said as near as I could tell till I could see your processes—as near as I could judge."

All that this testimony proves, if anything, is that Sprague, as a manufacturer of buckle levers and similar goods, estimates that the defendants' mode of making buckle levers, at the time that this testimony was taken, with an altered machine, which has never yet been before the Court to determine whether it infringed complainant's patents or not, and which Sprague had never seen, would cost ten or twelve cents a gross more than it would cost to produce them by the machine of his patents; and that he is unable to tell what the difference in cost would be between the way the defendant was then practicing in making such buckle levers, and their production by the use of the machine which was held to infringe the patents; but that an approximate statement of such saving between the infringing machine and the altered machine would be nearly as much as that of the machine of his patents; and that this approximation of saving is based upon experience that he has had in making fasteners for stair rods. No such conclusion as the Master arrives at, in the findings above quoted, can be legitimately reached from any such testimony; but on the contrary such testimony fails to make out, with any degree of certainty, such as is required in investigations of this character any savings or profits accruing to the defendant by the use of the one infringing machine.

2D, 3D, 5TH, 6TH 7TH AND 11TH EXCEPTIONS.

II. For that said Master in his report rejects the testimony of Mr. E. A. Smith, whom he finds "has had large experience in the manufacture of similar brass goods, and whose estimate is probably as good as any off-hand estimate would be," as a mere estimate, and accepts

the testimony of the complainant, which is confessedly only an estimate, while it is not shown nor claimed that he has had greater or even as much experience or in anywise more competent to make such estimate.

III. For that said Master in his said report finds that the buckles made by Osborn & Cheesman in 1878 were inferior to complainant's buckles, whereas his finding should have been solely with reference to the levers, that portion of the buckle made on the infringing machine, but in either case such finding is not supported by the evidence, but is contrary to the same.

V. For that said Master in his said report finds from the testimony of Mr. Fergus Kelly as to the cost of the Osborn & Cheesman lever "that an aggregation of the prices stated by him in detail would amount to more than two cents above his first-named cost," which is not supported by the evidence, but is contrary to the same.

VI. For that said Master in his said report finds that the Osborn & Cheesman levers had less work upon them than the complainant's levers, which is not supported by the testimony.

VII. For that said Master in his said report finds that the testimony of the defendant's witnesses is all untrue, because he finds a supposed discrepancy between the witnesses as to the cost of producing levers by old methods, and the return of the defendant and the testimony of its officers, which supposed discrepancy is not suppored by the evidence, but is contrary to the same.

XI. For that said Master fails to find in his said report that the cost of producing levers on the infringing machine was $2\frac{1}{3}$ cents per gross; that the cost of producing such levers by the old methods was from $2\frac{1}{2}$ to $3\frac{1}{2}$ cents per gross; that the saving to the defendant by using

the infringing machine did not exceed 1⅛ cents per gross, and that the patented machine effected a saving of only 3⅓ cents per gross over old methods, all of which is supported by and should have been found from the evidence.

As opposed to the uncertain, unsubstantial and unreliable testimony of Sprague, to which we have just referred, the defendant has taken the testimony of E. A. Smith, who, the Master says, on page 142 of the record, was:

"A witness of very large experienee in the manufacture of similar brass goods."

And Fergus Kelly.

The Master's erroneous findings, based on this testimony, form the basis of the 2d, 3d, 5th, 6th, 7th and 11th exceptions to his report.

Earl A. Smith testifies that prior to May, 1880, there were two well-known methods in use, either of which could have been employed to have made the buckle lever produced by the defendant's machine. The first, by cutting the blank from the sheet of metal, drawing it into U shape, and then forming it into proper shape on a frame or mandrel in a press. The second way was to stamp the blank after it was cut out, into such a shape, that when it was folded together in the middle, which could be done by one operation in the press, it would be made ready to attach to the buckle frame; and that it would have required no invention to have adapted either of these methods to the manufacture of buckle levers like that made by the defendant's machine (Qs. 1 to 14, pages 125 to 127 of the record.)

He produces two articles similar to buckle levers in form and material, each made by the first described method, and marked Exhibit E. A. Smith, No. 1 and No. 1*a*.

These were cut out by a press, formed into U shape, and then completed into their present shape by tools marked Defendant's Exhibit E. A. Smith, No. 2 and No. 3 (Qs. 6 to 10 and 19).

Exhibit No. 2 was actually made and used in the latter part of 1877, and No. 3 in December, 1879, or January, 1880 (Qs. 7, 19.)

He also produces an article similar to the buckle lever, marked Exhibit E. A. Smith No. 5, made by the second method before referred to, and by the tools marked Exhibit E. A. Smith Nos. 6 and 7, and describes how those tools were used (Qs. 11 to 14).

He further testifies that it would cost, according to his estimate, $1\frac{1}{4}$ cents a gross to form Exhibit No. 1*a* into U shape, and to complete it $2\frac{1}{2}$ cents a gross, making $3\frac{3}{4}$ cents a gross, and that he manufactured a number of hundred gross of such articles (Qs. 15, 16).

He further testifies that the cost of making Exhibit E. A. Smith No. 1, by tools marked Exhibit No. 2, would be, for cutting and forming into U shape, $\frac{1}{2}$ a cent a gross, and for finishing on the mandrel $1\frac{1}{4}$ cents a gross, making $1\frac{3}{4}$ cents a gross (Q. 17).

Basing an estimate upon his experience with these very similar articles, he further testifies that to cut and draw the buckle lever made by the defendant into U shape would not cost any more per gross than the same operations on Defendant's Exhibit No. 1, that is, $\frac{1}{2}$ a cent a gross ; to finish them on the mandrel might cost from $\frac{1}{8}$ to $\frac{1}{4}$ of a cent a gross more than to finish Exhibit Smith No. 1, which would amount to from $1\frac{3}{8}$ to $1\frac{1}{2}$ cents a gross, making a total of from $1\frac{7}{8}$ to 2 cents a gross for labor.

Kelly testifies that he was employed by the Osborne & Cheeseman Company, as foreman, for 17 years; their business being the manufacture of sheet metal and cutting the same up into all kinds of articles; that some time, early in 1879, or about four years before he gave his testimony, which was in January, 1883, that company was engaged in the manufacture of buckles, each having a lever similar to the one made on the defendant's machine. To manufacture this lever sheet metal of the width to make the blank was fed into a machine

and formed into blanks with two slots cut in them. Each blank was then put into a foot press and indentations or beads made between the slots and the edges; it was then put into another foot press which formed it into U shape; it was then put onto a hand mandrel between dies which formed it into shape, when it was snapped onto the buckle frame (Qs. 54 and 55, page 132 of the record).

This company made 300 to 400 gross of these buckle levers (Q. 59).

These levers cost a good deal because of the few that were made, and because a large price, to insure good work, was paid for piece work to start with. These levers at this large price cost the company about $3\frac{1}{2}$ cents a gross, and an addition of 10 per cent. for power, which would make the cost a little over $3\frac{17}{20}$ cents per gross (Qs. 59–60).

On cross-examination he testifies that it cost 1 cent a gross to stamp the indentations or beads between the slots and the edges of the lever; and $1\frac{1}{4}$ or $1\frac{1}{8}$ cents, the exact amount of which he had forgotten, for bending them into U shape; and $1\frac{1}{4}$ cents for forming the sides upon the hand mandrel between dies; and that the cost of cutting was figured at 1 cent a gross, but did not amount to that. This would aggregate $4\frac{3}{8}$ to $4\frac{1}{2}$ cents a gross, which is about $\frac{13}{20}$ of a cent more than the aggregate of $3\frac{17}{20}$ cents a gross, given on his direct examination (x-Qs. 83 to 87).

He also testifies that these buckle levers could have been produced by making the proper indentations upon the flat blank and then folding the same in the middle to produce the completed lever, which method he thought of using when he began making them, as it was an old and well-known mode of forming such articles which had been previously used upon similar articles produced by Osborne & Cheeseman, the method being shown by Exhibit Kelly No. 12 (Qs. 56, 58, 66).

That in his judgement the buckle levers could have

been made exclusive of the cost of material by this method, at from 2 to $2\frac{1}{2}$ cents a gross for labor, to which, adding 10 per cent. for the finished article, would make the cost of labor about $2\frac{3}{4}$ cents a gross (Q. 67).

Kelly further testifies that during his examination he had been at the factory of the defendant and there examined the machine which it was then using for making buckle levers, which machine cut the blank with the two slots in it from the strip of metal; then it was operated upon by the dies which gave the blank the proper form, when it was taken to a foot press and struck into the form of a completed lever like Kelly No. 5 (Re-direct Qs. 127 to 129, page 139 of the Record).

He further testifies that the method employed for forming the blank in that way was an old and well-known one (Re-cross Q. 132, page 140 of the Record).

This mode of making the levers, it will be seen, is substantially the same as that referred to in his testimony last above averted to, in which he estimates, that the cost of labor with power added, for producing buckle levers by this method, would be about $2\frac{3}{4}$ cents a gross.

In corroboration of these estimates of E. A. Smith and Kelly is the testimony of E. S. Smith, who says that on the machine referred to by Kelly as then used by the defendant, 500 gross of buckle levers a day could be produced at an expense of $1.50, which would be $\frac{3}{10}$ of a cent a gross, which, added to one cent a gross for finishing them on a foot press, would be $1\frac{3}{10}$ cents a gross (Qs. 106 to 109, page 137 of the Record).

From this testimony it appears that according to the estimate of E. A. Smith, based on wide experience in making similar article, it would have cost to have made the buckle levers by the old methods and devices $1\frac{7}{8}$ to 2 cents a gross; that according to Kelly's estimate, based upon experience in making similar

articles, it would have cost from about $2\frac{1}{2}$ to $2\frac{3}{4}$ cents a gross to have made these buckle levers by old methods and devices; and that the cost to Osborne & Cheeseman when they actually did make such levers, and which cost is very large for the reasons stated by Kelly, was from $3\frac{17}{20}$ cents to 4 cents or a trifle over, a gross for labor.

The Master distinctly finds:

"That by the processes known to the art in making similar brass goods, open to the public to employ, requiring no invention but simply adaptation, the defendant could have made the levers."

Page 143 of the record.

Again he says:

"Anybody was at liberty to make them by hand, by mandrels or dies or by any other method open to the public * * * They were simple of construction and almost anybody could have made them, and it is beyond a doubt that any experienced worker in brass could have made them by many methods with varying expense."

Page 145 of the record.

As there is no testimony but that of E. A. Smith and Kelly on this subject, he must have based these findings on their evidence.

He seems, however, to have given no weight to the testimony of E. A. Smith, as to what it would have cost to have made buckle levers by the old and well-known methods and devices open to the public, because it was only an estimate; and, probably for the same reason, he also placed no reliance upon the evidence of Kelly as to what it must have cost to have made these buckle levers by old and well-known methods and devices. We are at loss to understand how he could disregard the evidence of these two unimpeached, intelligent witnesses, and yet accept the testimony of Sprague, whose estimate, as we have before pointed out, is based on the most unsatisfactory and unreliable data.

The Master also ignores the testimony of Kelly regarding the cost to Osborne & Cheeseman of buckle

levers they made because he thinks his, Kelly's, recollection was not very distinct, and that an aggregation of the prices as stated by him in detail in his cross-examination would amount to more than two cents above the cost first named by him; and that the Osborne & Cheeseman goods had less work on them; and that because they were offered for sale at twenty-five cents more than what the complainant ever asked for his for years without takers, indicates very strongly that either the goods were inferior or that Kelly's memory is greatly at fault as to the cost or labor upon them.

Every statement of fact and every deduction contained in this statement is erroneous We have adverted to the cross-examination of Kelly, where, upon going into detail as to the cost of making the buckle levers by Osborne & Cheeseman, he recollects that the stamping of the beads or indentations between the slots and the edges of these levers cost a cent a gross, and the finishing of the sides upon the hand-mandrel between dies $1\frac{1}{4}$ cents a gross, which would make $2\frac{1}{2}$ cents a gross, that he recollected; but he was unable to state what was paid for bending them into U shape, but gives $1\frac{1}{4}$ or $1\frac{1}{8}$ cents, which would make $3\frac{1}{2}$ cents a gross; and the cost of cutting the blank, although figured at a cent a gross, he says did not cost that; but assuming that it did, the entire cost at the highest figures he gives in detail would be $4\frac{1}{2}$ cents a gross, or a difference of only $\frac{1}{2}\frac{3}{0}$ of a cent a gross, instead of 2 cents, as the Master states. Kelly testifies positively that the cost of making these buckle levers was $3\frac{1}{2}$ cents a gross, with ten per cent. added for power, which would make $3\frac{1}{2}\frac{7}{0}$ cents a gross; but he does not pretend to recollect the details of the cost of such operations. It is therefore very unfair to take the aggregate of these details, instead of the lump cost, which he would have been likely to have recollected and did recollect.

Again, there is no evidence going to show that the Osborne & Cheeseman goods had less work on them

than the buckle levers made by the defendant or complainant. Again, there is no evidence that they were offered for sale at 25 per cent. more than complainant asked for his for years without takers. With regard to this last statement of facts, made by the Master, the evidence is as follows:

De Forest swears in answer to question 105 (p. 94 of the record), that Osborne & Cheeseman's agent showed him some that they had made, and then stopped making and said there was nothing in it—that is, no money in it for them. And again, in answer to cross-question 130 (page 97 of the record), he says that he saw them in the autumn of 1880; and in answer to cross-questions 131 and 132, he says he knew of their selling a few in the market; and in answer to cross-question 133, he says he only knew the quantity sold and the price obtained for them from what their agent told him. In answer to cross-question 134, he says the agent told him that they sold them for $1.25 a single gross, and he afterwards understood that the price was reduced and they were closed out.

On cross-examination Kelly says that they did not sell all of these buckle levers made by Osborne & Cheeseman; that those that were not sold were still in the mill; that although there were three salesmen, none of them tried to sell them, as they were a new article to them and they could not class them with any other of their goods (x-Q. 73 to 77, page 135 of the record).

That although Osborne & Cheeseman made buckles of other kinds, they were sold to parties who did not use buckles with this lever (Re-direct, 101).

That he never heard any complaint of any defect in the buckles containing them (Re-direct, 102) and that the reason why they were not sold was because no salesman considered them within his line, and therefore made no special effort to sell them; but that some of them were sold to Candee & Co., of New Haven (Re-direct, 103 to 105).

This is all the testimony from which the Master could have taken the statement of facts referred to, or from which he could have made the deduction which he has.

It thus appears that although the agent asked 25 per cent more for them than complainant asked, they were not offered for sale at such prices for years without takers, and that the reason the goods were not sold except to Candee & Co., was not because they were inferior, but for the reason, fully given, on account of the failure of the salesmen to make efforts to sell them; and none of this testimony indicates that the memory of Kelly is greatly at fault as to the cost of labor upon them.

4TH EXCEPTION.

For that the said Master, in his said report, in one place finds from the statement filed by the defendant, and supported by the testimony of Mr. E. S. Smith, manager of the defendant corporation, that the cost of producing levers on the defendant's infringing machine was $8\frac{3}{10}$ *cents per gross, while in another place from the same testimony he finds that it cost* $8\frac{1}{2}$ *cents per gross, neither of which are supported by the evidence, but are in flat contradiction thereof.*

The Master states further that—

"Mr. E. S. Smith, the treasurer and manager of the defendant corporation, presents a statement of the defendant, which he supports by his oath, that the production of buckles in the infringing machine cost it for labor $8\frac{3}{10}$ cents per gross."

Page 142 of the Record.

And again he says, referring to the defendant:

"It deliberately adopted a method costing on the testimony of E. S. Smith and Lawton, $8\frac{1}{3}$ cents."

Page 142 of the Record.

And again he says:

"E. S. Smith also asserts, as before referred to, that its statement is entirely correct in making the cost per gross of these buckles in the respect of labor 8½ cents; but on cross-examination he shows he is unable to establish the fact but by mere assertion. No count was ever made or any record kept of either production or expense."

Page 143 of the Record.

The Master seems to reject the testimony of Kelly and E. A. Smith, principally, if we understand his report, because the statement of the cost of 8½ cents a gross in labor to produce the defendant's buckle levers, is entirely irreconcilable with this testimony of Smith and Kelly of what it would have cost by old and well-known devices and methods, which was only from 2 to at most 4 cents a gross for labor, and he concludes for this reason that—

"Either the defendant could not have produced these buckles at all by the old, well-known easy and non-interfering methods open to the public, or else the complainant's patented methods adopted by the defendant made a saving over these methods."

Page 143 of the Record.

And he further says:

"I find that by the processes known to the art in making similar brass goods, open to the public to employ, requiring no invention, but simply adaptation, the defendant could have made the levers, but that so far as the defendant then knew or could then discover or estimate, all such processes were more expensive and costly than the process invented by the complainant, and embodied in the automatic machine of the defendant employed by it to make these buckles; and I therefore discard as untrue altogether the defendant's evidence as to savings, which proves instead thereof such needless losings, and rely alone on the complainant's evidence to this fact."

Page 143 of the Record.

As this conclusion of the Master seems to be based upon this conflict of testimony, it becomes very important to examine the testimony to ascertain whether it is a fact, as shown thereby, that the cost of labor on de-

fendant's machine in the manufacture of these buckle levers was 8½ cents a gross.

The original statement filed by the defendant in compliance with the notice of the Master alleges:

> "That the cost of producing (exclusive of the cost of metal), said levers on said machine, was 2⅓ cents per gross * * * The method of computation is as follows: The machine would produce per day 150 gross of levers at a cost of $3.50 per day for a skilled workman, including time of machinist to run it."
>
> Page 86 of the Record.

Subsequently the Master required that the defendant should make return of the number of buckles having levers which were made on the infringing machine, and sold by it, and the cost of producing said buckles, what was obtained for them and to whom they were sold. In this statement the cost of the brass and the scrap from which these buckle levers were made was shown for each of the three sizes; the cost of the malleable iron frames with which these buckle levers were combined and the cost of dipping and lacquering these frames; the cost of blanking and forming these levers on the machine; and the cost of subsequently attaching them to the buckle frames, such as setting, rounding and closing, and the cost of packing the same. This statement shows just what the previous statement showed, that the cost of blanking and forming or of producing the levers on the infringing machine was 2⅓ cents a gross for each size, while the cost of attaching these levers after they came from the machine to the buckle frames, and of setting, rounding and closing the same, and of packing the same, amounted to over 5¾ cents a gross. The Master has, therefore, mistaken the entire cost in labor of producing the *buckles* and packing the same for the market, for the actual cost of blanking and forming, or producing the *buckle lever* itself on the infringing machine.

This is a grave error, and has misled him into the statements and deductions which he has made.

Instead of the statement, and the evidence of E. S. Smith with reference to it being irreconcilable with the testimony of E. A. Smith and Kelly, or that it shows a cost of labor on the infringing machine above that of producing buckle levers by the old methods and devices, it shows that the cost on defendant's machine of producing these buckle levers was only $\frac{1}{3}$ of a cent a gross above E. A. Smith's largest estimate, while it was $\frac{5}{12}$ below that of Kelly's estimate, and from $1\frac{1}{2}$ to $1\frac{2}{3}$ cents less than the actual cost to Osborne & Cheeseman for the buckle levers they made early in 1879, and for which they paid, as Kelly shows, extravagant prices for labor, in order, on the start, to get the best work.

10TH EXCEPTION.

X. For that said Master in his said report finds that the defendant, by Mr. Smith, its manager, is unable to establish the fact of the cost of producing levers on the infringing machine, which is contrary to the evidence.

The Master finds that the detailed costs by items is not supported by any one having personal knowledge of the same, or by any record or books (page 141 of the Record).

The 10th exception to the Master's report goes to this finding.

The two statements made by the treasurer of the defendant, as we have before shown, allege the cost of making the levers upon the infringing machine as $2\frac{1}{3}$ cents a gross.

E. S. Smith testifies that Lawton was the man who ran this machine and had charge of it (Q. 47, page 90 of the Record).

And that he got $4 a day when he was running the machine (Q. 53).

And he had a man who helped him, named Maine (Qs. 50, 51).

And at page 121 of the Record, he says:

"Int. 322. You have an item here for blanking and forming of $2\frac{1}{3}$ "cents per gross; what is that for, and how is that sum reached?

"A. It is reached by taking accurate time of a week's work of "the machine in question, and the cost of labor in attendance upon "the machine.

Lawton testifies that in running the enjoined machine it required an attendant constantly, and in addition his own attendance for about two-thirds of the time (x-Qs. 211 to 213, page 102; Qs. 184 to 196, page 101 of the Record).

It thus appears that it cost to run the machine two-thirds of the wages of Lawton, which were $4 a day, or $\$2.66\frac{2}{3}$, while the rest of the expense due to having an attendant constantly at the machine, deducting the $\$2.66\frac{2}{3}$ from $3.50, the sum named in the statement for wages, would be $83\frac{1}{3}$ cents a day for this attendant, which is not an extravagant estimate for a man's labor. It, therefore, cost in wages of these two men $3.50 a day to produce 150 gross or $2\frac{1}{3}$ cents a gross.

The testimony of Lawton and Smith is uncontradicted as to this cost, and we are at a loss to understand how the Master could have made the finding he did, referred to by us under this exception.

1st Exception.

1. For that said Master in his said report found that the savings of the defendant by the use of the infringing machine amounted to the sum of $4,480.50, which is unsupported by and contrary to the evidence, whereas the said Master should have found that such savings was only the sum of $522.72, and no more.

From these considerations it will be seen that the Master erred in finding or assuming that the defend-

ant's machine made as great savings in labor as the machine of the complainant's patent.

That he also erred, assuming that the savings of the two machines were the same, in finding upon the testimony of Sprague, alone, that the saving in labor by the use of the machine of his patent was ten cents a gross on the buckle levers, especially as such testimony was based on no reasonably fixed or accurate data by which such savings could be determined. That he erred in ignoring or refusing to give any weight to the testimony of E. A. Smith and Furgus Kelly, each of whom was an old experienced producer of brass articles similar to those made by the defendant's infringing machine, and each of whom gave reasonably accurate data, and much more so than that of Sprague, as to the cost in labor of producing these buckle levers by the old and well-known processes, open to the public at the date of the infringement, for producing similar articles, and which, without any invention, could have been adapted to produce these identical buckle levers. That he erred in finding that, according to the testimony of E. S. Smith and Hugh Lawton, it cost in labor to produce these buckle levers by the defendant's machine $8\frac{1}{2}$ cents a gross, the fact appearing in the original statement filed by the defendant and in the testimony, that such labor cost $2\frac{1}{3}$ cents a gross.

That he erred in finding that no data was furnished to determine what the cost was in labor in producing these buckle levers on the infringing machine, in view of these statements and the testimony of E. S. Smith and Hugh Lawton.

That he erred in not finding as the fact from these statements and testimony that the cost of labor in running the infringing machine in producing the buckle levers was $2\frac{1}{3}$ cents a gross; while the cost was $3\frac{1}{2}$ cents per gross in labor, taking almost the maximum and far above the minimum cost given for producing such buckle levers by the old and well-known methods

and devices, capable of producing the same without invention, and open to the public at the date of the infringement; and that therefore the saving due to the machine was the difference in the cost between the production by such old and well-known methods and devices and the actual cost in producing them by the infringing machine, viz., $1\frac{1}{6}$ cents per gross, which on the 44,805 gross actually made by the infringing machine would have made $522.72, a liberal amount, and the most that he should have found as profits accruing to the defendant by the use of the infringing machine.

We think it clear, therefore, that the Master has been in error in his findings of fact, and that he should have reported that such recovery should be, not the sum of $4,480.50 which he has found, but a sum not to exceed $522.72.

Sep. 22, 1887.

GEORGE E. TERRY,
M. B. PHILIPP,
Of Counsel for Appellant.

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SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1887.

IN EQUITY.

THE SMITH & GRIGGS MANUFACTURING COMPANY, APPELLANT,

vs.

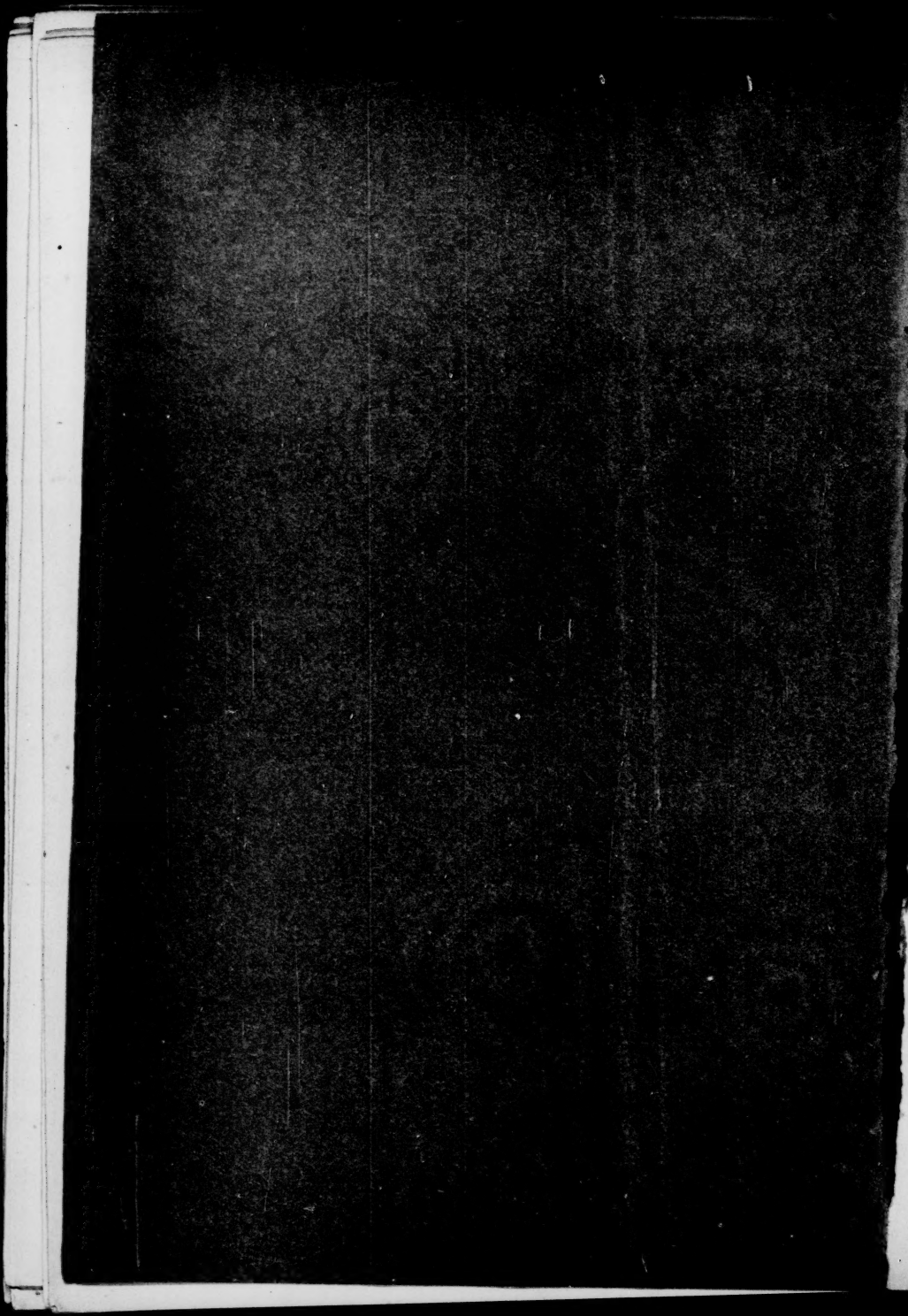
LEONARD A. SPRAGUE, APPELLEE.

BRIEF FOR APPELLEE.

CHARLES E. MITCHELL,

Of Counsel.

Atkins Printing Co., New Britain, Conn.



Supreme Court of the United States.

IN EQUITY.

THE SMITH & GRIGGS MANUFACTURING COMPANY, Appellant.

VS.

LEONARD A. SPRAGUE, Appellee.

BRIEF FOR APPELLEE.

The bill of complaint is for infringement of Letters Patent No. 228,136, dated May 25, 1880, and Letters Patent No. 231,199, dated August 17, 1880, for improvements in machines for making buckle levers.

The complainant claims that the defendants have infringed the first, third, fourth, and fifth claims of No. 228,136, and the first, second, third, fourth, and fifth claims of No. 231,199, and his expert, Mr. H. H. Doubleday, so testifies.

The defendant, by his expert, Mr. Brevoort, seeks to defend against the charge of infringing the fifth claim of the earlier patent and the first claim of the later patent, but as to all the other claims the only defense is that a machine containing them was in public use for more than two years prior to the application for letters patent. (See Judge Shipman's opinion, Rec. p. 79).

We say:

1. The defendants infringe the two disputed claims as well as the remaining claims, whose infringement they do not dispute.

2. The defendants have not established two years of public use prior to the application as to the subject matter of the undisputed claims.

3. There is no error in the finding of the matter of which the appellant can complain.

I.

The defendants infringe the two disputed claims.

This controversy relates to machines for making *beaded* arctic buckle levers, or tongues, of a peculiar character.

The levers are made from a strip of metal by a succession of operations in the patented machine.

The first step is to produce the slotted blank, shown in Fig. 2 of Doubleday Drawing No. 1. (Rec. p. 60).

The next step is to produce the bent form shown in Fig. 4½ of Doubleday Drawing No. 2. (Rec. p. 63).

The next step is to produce the central double bead shown in Fig. 7 Doubleday Drawing No. 3. (Rec. p. 66).

The next step is to produce the double bead between the slot and the edge of the lever, shown in Fig. 9 Doubleday Drawing No. 4. (Rec. p. 67).

The corresponding steps in the operations in the *defendant's* machines are represented by the blanks and forms on the same drawings. Thus:

Fig. 2 a. (Smith & Griggs) corresponds with Fig. 2 (Sprague) on Doubleday Drawing No. 1.

Fig. 4½ a. (S. & G.) corresponds with Fig. 4½ (S.) on Drawing No. 2.

Fig. 7 a. (S. & G.) corresponds with Fig. 7 (S.) on Drawing No. 3, and,

Fig. 9 a. (S. & G.) corresponds with Fig. 9 (S.) on Drawing No. 4.

The remaining portions of the figures show the mechanisms which, connected in one machine, produce the intermediate forms and final form in both cases—the upper portion of the drawings representing the machine of Sprague, while the lower portion shows the corresponding parts of the Smith & Griggs machine.

No better brief description can be given than that found in the opinion of Judge Shipman, as follows:

"Although, as is apparent from the defendant's admission in regard to infringement, the two machines are very similar, they differ somewhat in form. In the plaintiff's machine after the two slots have been punched in the blank and it has been bent into a U-shape and has been thrust upon the end of a mandrel, a pair of movable dies 'are advanced, one on either side of the mandrel and blank, on lines substantially at right angles to the flat sides of the U-shape and of the mandrel. These dies have their engaging faces—that is, the faces that engage with the U-shaped blank—of such form and contour that when acting upon the U-shaped blank' in combination with the mandrel they bend or swage it into a partially formed lever.

In the defendant's machine, after the U-shaped blank had been pushed upon the end of the mandrel, 'there were two dies, one on either side of the mandrel, opposite to this U-shaped blank; one of the dies—the lower one—being stationary in close proximity to the mandrel; the other die—the upper one—reciprocating vertically; the opposing faces of these dies having a configuration the reverse of that part of the mandrel occupied by the U-shaped blank, and having, also, portions of their surfaces adapted to form the bit of the buckle lever. As soon as the U-shaped blank was placed on the mandrel the upper

movable dies descended, and by means of this die, the lower stationary die, and the mandrel, the U-shaped blank' was bent into the same partially formed lever which was produced by the corresponding operations of the plaintiff's machine. In the plaintiff's machine the sides of the mandrel and the faces of the dies are vertical, while in the defendant's machine the mandrel is horizontal, with a stationary die below it and a vertical reciprocating die above it." (Rec. p. 79).

Claim five of No. 228,136 reads:

"5. In a machine for making buckle levers, the combination with the mandrel M and dies $N\,N^1$ of the springs N^2N^2, to press the dies forward into proper position relative to the mandrel, substantially as set forth."

The mandrel M is the same mandrel which is found in claims one, three, and four of No. 228,136, and claims one, three, four, and five of 231,199, the infringement of which Mr. Brevoort does not deny.

The dies $N\,N^1$ are the same dies which are included in claims three and four of 228,136 and one, three, four, and five of 231,199, the infringement of which Mr. Brevoort does not deny.

The only remaining element is the springs N^2N^2, the office of which is to hold the mandrel and forming dies together by a yielding pressure, when the dies are not engaged in bending the metal between their faces and the walls of the mandrel.

It is admitted that the defendant's machine had a spring when this suit was brought, and that this spring held the mandrel and the forming die together by a yielding pressure. But still it is maintained that there is no infringement. Mr. Brevoort says:

"It may be that the Waterbury machine has the equivalent of the mandrel M referred to in the claim, so far as the invention of that claim goes, although it has a mandrel not having all the parts which are requisite for the mandrel referred to in the

patent. It may be, also, that for the purposes of the invention of the fifth claim the Waterbury machine has the equivalent of the dies N N^1 of the fifth claim; but, as there is no spring used in the Waterbury machine in connection with either portion of the single die there used or in connection with the mandrel, I do not think that the said Waterbury machine contains the invention of the said fifth claim, in which the two springs, each acting on one-half of the die, are made by the terms of the claim essentially necessary; consequently I am of the opinion that the Waterbury machine does not contain the invention of the said fifth claim, for the reason that it has not any equivalent for the springs N^2 N^2 referred to in that claim." [Record p. 68.]

Mr. Brevoort only saw the machine on the 19th of April, 1882,—the day before he testified—and then, if we understand Mr. Brevoort, the spring had been removed, the defendant relying (as we say) upon gravity to perform the function of the spring. So we need not here inquire whether gravity is the equivalent of elasticity in this connection, since the defendant *did* use a spring—But gravity is the equivalent of a spring when it performs the functions of a spring.

This spring is shown in Fig. 8^a (marked N^2) of Doubleday's drawing No. 4, (Rec. p. 67) which was made from inspection of defendant's machine. Mr. Doubleday says:

"Now in that defendant's machine while one of the dies was stationary, and there was no spring interposed between the movable die and its actuating mechanism [there was a spring pressing the mandrel against the fixed die], yet substantially the same result was obtained by so constructing the mandrel and its support, that it, the mandrel, pressed one leg of the partially-formed lever against the lower stationary die, thereby practically preventing the adjacent ends of the partially formed lever and completed lever from telescoping, as I understand the operation of that machine. . . . . It seems to me that such a change was a merely formal one, involving no substantial difference in the mode of operation of the parts or of the results produced,

and as I have already expressed the opinion that the mandrel and the dies in the defendant's machine were the equivalents of the mandrel and the dies in the Sprague Patented Machine, and as I regard the transfer of the yielding or elastic feature (which prevented telescoping) from the dies to the mandrel, as being a merely formal immaterial change, it seems to me that defendant's machine contained the invention recited in the fifth claim of the Sprague Patent No. 228,136."

[Record p. 25.]

Mr. Brevoort is, however of opinion that even with the spring N^2 of Fig. 8^a, there is no appropriation of the combination, because one spring is used instead of two. [Record p. 70.]

But it is manifest that any mechanic would see that if two folded blanks were so held by pressure that they could not telescope upon one side, then they could not telescope on the other side. Hence it would be instantly obvious that a single spring pressing the mandrel against one of the dies would prevent telescoping in the same way, by the same mechanical means, as a pair of springs pressing the dies against the mandrel. *It is too obvious for doubt that if the folded blank is held in the defendant's machine between* OUR DIES *and* OUR MANDREL *by a* SPRING-PRESSURE *so as to prevent telescoping, our invention is appropriated in every respect except immaterial form.*

The other disputed claim—number one of patent 231,199—reads thus:

"1. In a machine for making buckle levers, the combination of the mandrel M provided with the ribs m m^3 of the dies N N^1 O O and a support which presses the part *u* of the lever against the rib *m* substantially as set forth."

This support is called n^2 in the patent and is shown in Figs. 5 and 6, and 5^a and 6^a of Doubleday's draw-

ing No. 3 (Rec. p. 66.) Mr. Doubleday testifies that this claim is infringed, giving reasons. [Doubleday Rec. p. 25, Q. 12.]

In so testifying Mr. Doubleday does not ignore the differences of form which are so apparent in the two machines, but says:

"In view, however, of the fact that, as I understand the matter, Sprague was the first to combine in a machine to make buckle levers, the elements which are embraced in that claim, I am of the opinion that the invention is not limited to a support which is attached to and travels with one of the dies, nor to a support which can yield or be withdrawn to facilitate sliding the partly formed lever on the mandrel. But, on the contrary, while the Sprague support is described as having these peculiarities, or some of them, yet they are merely incidents of construction, and it seems to me that it is not necessary that the support in the defendant's machine which corresponds to the tongue n^2, should be either yielding or movable in order to be the equivalent of that Sprague support in the combination covered by that first claim of patent 231,199. Neither would such support, in my opinion, fall short of being an equivalent of the Sprague support, even though it did yield slightly under pressure."

(Rec. p. 26, Q. 12.)

That Mr. Doubleday is right in thus regarding as immaterial the fact that the support is attached to the fixed die of defendant's machine instead of the movable die is apparent from the fact that unless the difference between a movable die and a fixed die is immaterial the defendants have thrown away their case on the claims which they do not oppose.

Mr. Brevoort says:

. . . . . For the reason that the Waterbury machine has not a mandrel provided with the ribs $m\ m^2$; for the reason that the Waterbury machine has not got a second pair of dies referred to by the letters O O in the claim, and for the reason

that the Waterbury machine has not got the support which is removed after the action of the dies, and which support is referred to in the claim, I am of the opinion that the said Waterbury machine does not contain the invention of the first claim of the Sprague patent No. 231,199. [Rec. p. 70.]

Let us see if these reasons are sound. Mr. Brevoort says the mandrel is not provided with both the ribs m m^3. But he agrees that it has the rib m, and as to the rib m^3 the defendant has simply transferred it to the V-shaped die, where it is used to hold the V-shaped blank from coming up out of its die, precisely as the rib m^3 prevents the V-shaped blank from coming out of its die in complainant's machine. But the cross-examination of Mr. Brevoort amply shows that the difference is one of form only:

x-Q. 17. Your last sentence having indicated a purpose to finally look at this question from a mechanical point of view, and having indicated your opinion that the change could be made and the machine would work, will you now please come to the consideration of my original question, which was whether it would work in substantially the same way in accomplishing the function referred to, viz.: the prevention of the withdrawal of the U-shaped blank upon the ascent of the folder?

A. It *would work in substantially the same way for the accomplishment of the same purpose*, the result being reached through mechanical devices differing from those described and shown in the Sprague patent.

x-Q. 18. Let us see about the mechanical means being different. *How would the mechanical means become different, the only change supposed being the changed place of support of the rib, the rib still continuing to prevent the withdrawal of the U shaped blank by interposing its lower face against the upper edge of the leaves of the bent blank?*

A. So far as preventing the withdrawal of the U-shaped shank from the matrix, the lower edge would serve the same purpose, however the rib might be supported; but whether or not it would serve the same purpose, if it does serve any useful

purpose in conjunction with a mandrel, would be another question, for the rib would then be separate from the mandrel, and without an accurate fitting of the parts, a space could be left where now solid metal exists, and it seems to me that this might be a material defect in the machine when changed as supposed.

All of the answer objected to, excepting the part ending with the word "supported."

[Rec. p. 73.]

It is too evident for discussion that in a combination of parts the mere change of place of support of an element involving no change of function, but leaving the parts to "work in substantially the same way for the accomplishment of the same purpose," does not avoid an otherwise successful charge of infringement.

But Mr. Brevoort does not find the dies O O. *They were taken out of the machine before he saw it*, as separate structures. It is enough that they have been used in the machine, and that to a very great extent.

But the support does not move away, "*after the action of the dies.*" The work of the combination is then done. A mere structural feature, having to do with the separation of the parts after the common functions of the combination have been discharged, is immaterial.

The following from Mr. Brevoort's testimony shows how closely the defendant has copied our combination, only taking care to make the formal changes as spectacular as possible:

x-Q. 24. Since the exception contained in your last answer excludes the function to which I have been calling attention, I shall try to be content with it as a round-about way of saying that *quoad* the functions I have referred to, the mechanical means, are the same in the two supposed cases, and will now direct attention to the function of the rib m^3 in other relations.

The rib m^3 holds the U-shaped blank in its proper relation breadthwise of the mandrel when the U-shaped blank is struck by the die, doesn't it?

A. I presume that is its intention, though it is not so described, as far as I can find in the specification.

x-Q. 25. The mandrel, in the arrangement described in the Sprague patent, is the fixed member of the blank-shaping system, is it not?

A. Yes.

x-Q. 26. In defendant's machine, however, one of the shaping dies is fixed, and the mandrel and the other die are movable (I refer to the machine you saw) are they not?

A. Yes.

x-Q. 27. And m^3 so far forth as it operates to prevent the movement of the blank breadthwise of the mandrel is taken from the fixed member of the arrangement described in the Sprague patent, and transferred to the fixed member of defendant's arrangement, is it not, to wit, the lower die?

A. There is a ridge upon the lower die in the defendant's machine, *which tends to keep the blank in the correct position breadthwise*, but I do not consider that this projection is the equivalent of m^3, although it may serve the same purpose."

[Brevoort, Rec., p. 75.]

Mr. Brevoort answered further, but we have quoted all that we deemed responsive, or to the point. It is enough for us that the defendant employs the rib m^3 to keep the blank from coming out of the matrix and to keep it in its proper position *breadthwise* of the mandrel as it is fed forward. Whether he cuts it into two pieces, or whether he mounts it here or there, *so long as he takes care to have its operative part in position to do the same work that Sprague does, in the same way that Sprague does*, we don't care.

It follows that the defendants infringe the two disputed claims as well as the several claims, which they do not claim to avoid on the issue of infringement.

11

Two years' prior public use is not proven.

The earliest date of application is the date for both patents.

Where a second application is filed for a certain part of an invention disclosed in a prior application, the two applications will be regarded as a continuous proceeding, and public use of the invention, to defeat a patent granted upon such second application, must be shown to have occurred more than two years prior to the first application.

[Graham v. McCormick, 21, O. G., 1533.]

The earliest application was made Dec. 2, 1878.

Was then the patented machine in public use or on sale, within the meaning of the statute, before the 2d day of December, 1876?

The facts are as follows, as derived from the testimony of Mr. Sprague, who is the *only* witness called to prove the *public use* of the patented machine. Mr. Edmund Jordan, indeed, testifies to some of the *earlier* stages of building the machine, which, however, he never saw in use, but no witness, other than the patentee himself, is called to show *public use* more than two years before the application. It may not be against public policy to allow prior public use to be proved by the inventor alone, but it certainly does not afford a propitious outlook for this defense when not a single person is to be found among the public at large by whom such public use can be testified to.

It is to be kept in mind that the patented thing is a machine for making buckle levers like those represented in Fig. 9 of letters patent No. 231,199. The same lever is shown in Fig. 10 of No. 228,136.

Thus, No. 231,199 says:

"Fig. 9 is a perspective view of the completed lever."

This buckle lever is for use in the "arctic" buckle or buckles for use upon "arctic" overshoes, and its distinguishing characteristic, as compared with other buckles, consists in the slot through which the strap is permanently attached, *in connection with the dou le bead adjacent to the slot* around which bead the strap is passed. This perfected buckle was matured after Mr. Sprague had been making buckles having some of its features for many years, and the patented machine consists of a complex combination of parts automatically producing this beaded buckle from a strip of metal automatically fed into the machine.

In producing this machine Mr. Sprague borrowed no characteristic feature whatever from other inventors, but, appropriating some of the elements from his former inventions, *and devising others with special reference to the new structure*, he at last, in the spring of 1868, completed a practical machine embodying new combinations and capable of successful operations in producing the *beaded* buckle lever used upon "*arctic*" overshoes.

The problem so long before him was a difficult one. The machine was necessarily complex, involving not only difficult operations but a number of them. *It was specially difficult to successfully produce the beads between the slot and the rear edge of the buckle.* To so hold the buckle with precision *that the bead should be exactly parallel with the slot* and yet *allow it to be freely fed;* to so bend the buckle *that the beads when formed should always be opposite each other and present a*

rounded exterior to the enclosing strap; to even bend the stiff metal *between the edge and the slot*—to do all these things *practically* in an automatic machine, that, to be practical, must make *all* the levers sucessfully and *not destroy some and perfect others*, was a task calling not only for invention, but for test and trial and further invention, and further test, alteration, and addition and invention, until, if patience should prevail and ingenuity should be adequate, the machine should at last stand forth completed and approved.

Mr. Sprague made a buckle—not the *beaded* arctic buckle lever—in 1862. He used *three different machines* for that purpose.

The following testimony refers to this product of three different machines:

"Q. 14. The cutting out of the blank with the holes was performed in a separate press from, and disconnected from, the other press that drew them up in the U shape; is that so?

A. At that date it was.

Q. 15. And the pressing of this U-shaped blank into form on a mandrel was done in still a third press independent of the other two, was it?

A. Yes sir."

[Sprague, Rec., p. 49.]

This was done until 1867 or 1868. [Sprague, Rec., p. 49, Q. 18.]

From 1867 or 1868 to the fall of 1873, a certain class of levers, not *beaded* "arctics," were made "in one operation."

"Q. 44. You have testified that from 1862 to about 1867 or '68 you made these buckle levers by three independent presses conveying the metal from one press to the other by hand; what

I want to know is, how you made these buckle levers from between the years '67 and '68, and up to about the fall of '73?

A. One class of buckles were made by two operations, as I told you; but another class, *not arctics*, were made in one operation."

[Sprague, Rec., p. 51.]

From the fall of 1873 to the fall of 1874 the beaded arctic was made upon two machines—one to prepare for the beading, the other to put on the bead.

"Q. 36. What did the first one do?

A. It done as I have described, except putting on a bead on the tail of the lever.

Q. 37. And what did the second one do?

A. Put that bead on.

Q. 38. And how long did you use these *two* machines prior to the fall of '74?

A. I should think about a year; I have reference to the bead, which was formerly not put on buckle levers in that way."

[Sprague, Rec., p. 51]

Meanwhile an unsuccessful attempt had been made to produce the beaded buckle on this old machine.

"Q. 57. You made changes, then, as I understand you, in that machine so as to produce buckle levers by it some time between '68 and '80, and you can't tell when?

A. Not all of them; no.

Q. 58. Which of them, can you tell, and what were they?

A. I made one change—not successful, though—to put the bead on. I think that was in '70 or '71 or '72; somewhere along there."

[Sprague, Rec., p. 52.]

Indeed the machine "never did work good," even in making non-beaded levers [Sprague, Rec., p. 52, Q. 47.] But it was a failure when beaded levers were attempted.

"Q. 92. What further operation was performed upon the buckle lever before it left the machine in the shape of a buckle tongue, prior to the fall of '74, than was performed by the dies pressing the U-shaped blank over the mandrel, last referred to?

A. I had nothing only the bead; I had made some on the old machine, *but without success; it didn't work.*"

[Sprague, Rec., p. 55.]

One reason of this failure is thus given:

"Q. 98. When you made this class of buckle levers and used the rib similar to m^2 in this old machine, what difficulty did you experience that made the machine as respects this feature unsuccessful?

A. One feature, *it broke the levers* that done the pressing, and *by not driving on to mandrel true, it wouldn't strike it in the right place* and had to be sent back by customers."

[Sprague, Rec., p. 56.]

Mr. Sprague saw that he could not make this old machine successful, and set about devising a new one, ordering the press from Bliss & Williams in 1874, *but making the parts in which this patented invention resides by his own hands or those of his workmen.*

"x-Q. 13. I suppose it was no part of Bliss & William's job to make the dies and other parts that were immediately operative in producing the buckle lever; am I right?

A. It was no part of theirs; there was a contract between Bliss & Williams and Mr. Sprague to make the press; all attachments and feed motions were made by day's work, as Mr. Sprague ordered them from time to time. They made the press at contract price.

x-Q. 14. Did Bliss & Williams make the dies?

A. I think not; any more than blanks for dies."

[Jordan, Rec., p. 47.]

"Q. 114. Who made the various other parts of this machine?

A. My workmen and myself."

[Sprague, Rec., p. 57.]

Mr. Sprague wholly abandoned the attempt to produce the beaded lever on the first machine.

"x-Q. 166. Did you give up trying to make arctic buckle levers on the old machine when you got the new one?

A. Yes sir.

x-Q. 167. You say in reply to question 96 that the old machine did not work successfully on one class of buckles; what class was that?

A. *The arctic lever with the bead.*"

[Sprague, Rec., p. 62.]

This disposes of the old machine. It "never did work good" on the non-beaded levers—it was a total failure for producing the *arctic lever with the bead.*

The new machine was in its general conception very different from the old one.

"Q. 70. How did that machine, as it was used prior to the fall of '74, resemble or differ from the machine shown and described in your two patents here in suit?

A. The press part was much heavier and a shorter motion; no shaft to connect levers, no operating cam levers, and various others."

[Sprague, Rec., p. 53.]

This machine so far approximated completion in the fall of 1884, that, with a workman to stand over it and watch it and stop it when choked, it could be used. *But it was not then the complete automatic machine subsequently patented, nor is there any proof in the case whatever that it would not have been abandoned like the first machine, had not Mr. Sprague, by continued experiment, triumphed over all the difficulties, and at last produced a machine that was automatic in fact as well as in theory.*

The changes which made the machine practically as well as theoretically automatic, were made in the fall of 1877 and winter of 1878.

"Q. 116. When did you put the springs between the levers and the striking dies in that machine?

A. It was in 1877, in the fall.

Q. 117. When did you put the extension of the mandrel referred to as m^3 in your patent, in that machine in place of the point on the carrier to hold the U-shaped blank down in the matrix?

A. It was either in January or February, 1878. I think it was."

[Sprague, Rec., p. 58.]

The difficulties which had before existed were telescoping, and failure to make a proper bead behind the slot, and failing to drive on the mandrel.

"x-Q. 172. What had been the trouble up to that time?

A. Forming the bead or telescoping or failing to drive on the mandrel."

[Sprague, Rec., p. 65.]

Mr. Sprague *experimented* until he overcame the difficulties from these sources.

"x-Q. 175. Did you *experiment* from time to time to devise means to prevent it?

A. Yes, sir." [Sprague, Rec., p. 62.]

And he all the while intended to obtain a patent.

"x-Q. 183. State whether or not it was your intention, while you were experimenting upon and improving this last machine, to obtain a patent when it should be completed?

A. It was." [Sprague, Rec., p. 63.]

After completing the machine in the way described, there was no further trouble when the machine was in order.

"x-Q. 181. Did you have any practical trouble in any of these respects after you completed the machine in 1877 and '78, by the changes which you have described?

A. Not when the dies and tools were in order—mandrel, carrier, etc."

[Sprague, Rec., p. 63.]

Before the changes, the telescoping would take place *when the machine was in order, the defect residing in the organization.* After the changes it would only take place when the *machine was out of repair.*

"Re-re-d. Q. 205. What caused this practical difficulty after those changes were made?

A. There were several. The matrix wearing, the dies wearing smooth, not holding the brass evenly upon the mandrel, and the end of the carrier wearing so as to not force the U-shaped blanks on evenly.

Re-re-d. Q. 206. And those same things caused the telescoping in the machine before it was altered, didn't they?

A. Yes; *and when the dies wasn't worn it would telescope.*"

[Sprague, Rec., p. 65.]

Here, then, is a machine that worked badly by reason of its organization. It was so changed less than two years before the application that it always worked normally and well, except when out of repair.

Experimenting to remove the difficulty was constantly going on (a man meanwhile standing over the incomplete machine *to stop it when choked, and work the telescoping blanks off the further end of the mandrel with a pointed hook*), (Rec. p. 64, x-Q. 189.) until at last success was reached. It is true that the incomplete machine *plus the constant attendant* produced buckle levers, a portion of which were accepted by the purchasers, *but there is not a word of proof to*

show that that machine would have been an ultimate success, or that *it would not have been set aside from the first*, if it had not been for the expectation entertained by the inventor of finally making it a success. He always intended to patent it as soon as done. And having tested it a reasonable time, he applied for a patent long before the expiration of the period limited by law.

Meanwhile Mr. Sprague, who has always been, until the defendant's infringement, the exclusive manufacturer of these buckle levers, kept his machine from the public interested in such matters.

"x-Q. 184. State whether or not you kept the general public away from this machine while this process of experiment and completion was going on?

A. We did as far as we could, any party that we thought would want to use any such machine."

[Sprague, Rec., p. 63.]

How far he succeeded in his purpose to keep the machine from the public appears from the fact *that the defendants do not produce a single witness who ever saw the machine in use, either before or after completion, at any stage whatever.*

Doubtless the defendant will claim that, inasmuch as the incomplete machine contained the subject-matter of certain of the claims, imperfectly operating, more than two years before the application, therefore such claims are void. But there is no law for such a proposition If an inventor experiments in the direction of producing an automatic machine, intending, when his efforts are successful, to patent it, he need not enter in his diary the exact day and hour when each stage of inchoate and contingent completion

was reached, lest he forfeit each patentable element or combination which was tentatively complete two years before the application. *A machine is a unity.* The patent law authorizes a patent for a "*machine*," and the machine as an entirety *as patented* must have been in public use more than two years in order to make the patent invalid.

Of course a case is conceivable which at first seems to be an exception to this rule. A man may make a machine and adopt it as complete and perfect, and wholly cease from experiment and purposely omit to patent it. Some other person having appropriated the machine, he may, as an after-thought, make some slight improvement in the nature of an adjunct or auxiliary contrivance, and, patenting the whole, claim that the defendant is to be held an infringer of the whole machine. But that is not this case. Here experiment was never intermitted. Here the purpose to patent in case of success, was present from the first. Here the last improvements were essential to the machine as an automatic organization. Such *vivisection* as the defendants ask will not be performed in behalf of an infringer.

The following language is from Judge Shipman's opinion :

"The main defense is that the two patents, Nos. 228,136 and 231,199, with the exception of the latter, are void, because the machine, with the exception of the mechanism described in said claims, was in public use for more than two years before the date of the application for letters patent. But one application, dated December 2, 1878, for a patent upon the entire machine was originally brought. This was afterwards divided into two applications upon different parts of the same machine. In order

to defeat the patents, the machine must have been in public use before Dec. 2, 1876. (Graham vs. McCormick, 21 O. G., 1533.)

The facts are that from 1862 to 1868 the patentee made another kind of buckle from those produced by this machine upon two or more different machines. Between 1868 and the fall of 1873 another kind of buckle was made by one machine. For a year prior to the fall of 1874 he made the "beaded" buckles—*i. e.*, the kind now under consideration upon two machines.

In 1874 he ordered the skeleton of the patented machine from Bliss & Williams, his workmen or himself making the patented portions. The machine was in a condition in which it was used to manufacture buckle levers in the fall of 1874, and continued to be so used without substantial change until the spring of 1878, but it was not a perfected invention. It had two defects, one that it choked, and the overlapping blanks *had to be picked apart by a workman;* another, that *the bead was not parallel with the slot*, because the blank could not be forced upon the mandrel evenly. Nevertheless it was used, in some seclusion from the public, to make levers, and it made about 50,000 gross, which were sold, but the organization was defective until it was perfected in the early part of 1878, after repeated experiments. The inventor always adhered to the idea of perfecting the invention and then obtaining a patent upon it. The two improvements which were introduced in 1878 were the springs between the levers, and the dies, which prevented overlapping, and the rib m^3 in order to keep the blank in position when it was forced upon the mandrel. These changes, which are apparently not of great importance, perfected the invention and enabled the inventor to take the final step between partial and complete success." [Rec. p. 80.]

We have printed in italics a few words in this opinion in order to show that the changes *which rendered the machine automatic* and *which made it produce perfect levers* were made within the two years before the application. These facts along with the other facts proven in the case and found by the Court make a clear case of compliance with the statute.

We cite in favor of our position the recent case of *Beedle vs. Bennett*, 122 U. S., 71, where the principles applicable to this defense are considered and applied in accordance with the principle that the law leans against forfeiture.

In *Manning vs. Isinglass Co.*, 108 U. S., 465, this Court said:

"It is also made clear by the testimony, not only that the machinery, but the process used by Norwood & Manning from 1860 to 1867, by Norwood & Son from 1867 to 1870, and by J. J. Manning & Brother from 1868 to 1873, and after that year, was substantially the same as that described in the patent. During all these years *there was no material change, either in the machinery or the process.* The use of the machinery and process was *not, therefore,* an experimental use. These conclusions of fact are fatal to the complainant's case."

The inference is clear that an experimental use being established, an incidental sale of such portion of the product as was saleable, will not change the character of the use, and create a forfeiture.

See also:

Agawam Co. vs. Jordan, 7 Wall. 583.
Winans vs. Railroad Co., 4 Fish. 1.
Jennings vs. Pierce, 15 Blatch. 42.
Pitts vs. Hall, 2, Blatch 229.

There was, therefore, for reasons given, no forfeiture of the right to obtain a patent.

III.

There is no error that the appellant can complain of in the finding of the master establishing the sum due upon the accounting to be $4,480.50.

The plaintiff below claimed, and established the fact to be, that he had sustained damage by the infringement complained of to the extent of $30,588.71. The circumstances under which this loss occurred are well stated by the master.

"The complainant further claims damages for this infringement as follows:

1. For reduction of prices.

Loss on	10,000 gross	$\frac{5}{8}$	inch, at	15c.	$1,500.00
"	"	$\frac{7}{8}$	"	20c.	2,000.00
"	"	$1\frac{1}{8}$	"	22c.	8,800.00
	Total				$12,300.00

2. Also for loss of profits on sales where defendant supplied complainant's previous customers with buckles made on infringing machine. 18,288.71

Total $30,588.71

If the defendant had made and sold the complainant's patented machine, whereby this loss of sales and consequent loss of profits and reduction in selling prices had been suffered by the complainant, I have no doubt but this would be a very plain case of damage in these respects.

It was a production having a very limited demand, and complainant, by reason of his previous patent, had come to supply all that demand; and he had the facilities to continue to supply it.

Not an Arctic shoe buckle was on the market from any other source.

Osborn & Cheesman had made a few, but had never put them on the market to any considerable extent. As soon as the monopoly enjoyed by the complainant on the buckle levers themselves was ended, the defendant took the complainant's improved instrumentality for making them, adopted it without leave or license, made buckles with it, and with these buckles went for the complainant's old customers.

In fact, it could go nowhere else, and every customer it obtained had been, and was the customer of the complainant at the time the defendant went into the market with these goods. No

one else touched this trade. Every sale the defendant made reduced by so much the complainant's sales. Defendant was a very active, pushing competitor. Complainant says that the defendant cut the prices, and defendant says that it followed the complainant's prices down in the market. The fact that complainant maintained the best prices would seem to disprove this, but I make no finding in this regard, as it is immaterial in my view of the case.

I find that the complainant could have maintained the prices received by him before the defendant entered the market but for the competition of the defendant, beyond all doubt, *and if this is a case for damages at all, the complainant had been damaged to the full of said amount claimed, to wit: $30,588.71, less the amount of savings heretofore reported; and I do so find.*"

[Rec., p. 144.]

But the master found that this was not a case for damages and so disallowed the whole sum claimed under that head. It should be added that Mr. Sprague claimed and supposed that he proved *that the production of the buckle levers by any other known method would cost more than he received for them when the infringement began,* so that his profit on the buckle was a fair measure of the saving effected by the use of the patented machine. The loss of this profit was, therefore, the loss of savings effected by the use of the machine. But the master made no finding with reference to the latter claim, and simply disallowed the entire sum due for damages actually sustained.

The master finds also that the profits made by the defendants upon buckle levers made by the infringing machine was $7,183.60. He reaches this conclusion by the following method: After finding that the production was 44,805 gross, and that the appellant claimed to have made no profits, he goes on to say:

"I cannot find this claim to be honest, and cannot find that the defendant made no profits.

Some light can be gained of the cost of making these buckles from Mr. Sprague's statement of the cost to him of making his buckles of similar sizes, on a similer machine.

He proves that the $1\frac{1}{8}$ cost him 56 cents per gross.
" " " " $\frac{7}{8}$ " " 47 " " "
" " " " $\frac{5}{8}$ " " 40 " " "

At these prices he could have made the 44,805 gross made by the defendant on the infringing machine; on his machine for $23,322.78, and thereby make a clean profit, even at the defendants selling prices of $7,183.60.

The facts, that the defendant charged his machinist's wages against this production, making the attempt to enhance costs very apparent, that no detail of costs by items is supported by any one having personal knowledge of the same or by any record on books, and especially the improbability that the defendant would have made these goods at a loss for so long a time to gratify the personal dislikings of one of its officers, in my mind, goes far to establish the complainant's figures as the correct ones as to the cost of these buckles; and there are some further inconsistences of evidence that will be touched upon further along in the report that have had their effect in discrediting the defendants evidence generally in this case.

And if the complainant is, by law, entitled to recover all the profits that the defendant made on these buckle levers that it made on the complainants patented machine, then I find that he is entitled to recover of the defendants, as profits in this case, the said sum of $7,183.60, as the profits the defendant made on goods sold by it, on the manufacture of which the infringing machine was employed. I do not consider however that such is the law in the case of unpatented products produced by a patented machine."

[Rec., p. 141.]

The master thereupon applies the principal which he regards as the true one, which he states as follows:

"and do find as matters of law in such cases, and in this case,

that only such savings of labor as the defendant saved by the employment of the complainants patented device over and above what their cost would be produced, by any other efficient method open for him to use in the production of these buckles, is properly recoverable in this case as profits." [Rec., p. 141.]

That this rule is as favorable to the defendant as it could possibly be entitled to there can be no doubt whatever.

Railroad Co. *vs.* Turrill, 94, U. S., 695.

Adopting this method and the testimony of the complainant as to the saving by his machine, and finding as a fact that the machines are substantially alike in saving capacity, the master reaches the conclusion that the saving was ten cents per gross. Thus the master says:

"Accepting, then, the saving of the defendant in the production of these buckles to have been the same by the employment of the infringing machine that complainant saved in the employment of the patented machine, as against any other known and open method, which was 10 cents per gross, I find that it saved, by so using the complainant's invention in the manufacture of the said 44,805 gross, $4,480.50, which I find should be repaid to the complainant as savings or profits in this case."

[Rec. p. 143.]

Of the claim of the defendant below that he made no savings, the master says:

"I cannot find this claim to be honest." [Rec. p. 141.]

The master sums up his statement of reasons for this finding of dishonesty in the following language:

"The defendant would apparently have it believed that when it could just as well have produced these buckles by old, well known, easy and non-infringing methods, at an expense for labor, by the testimony of E. A. Smith and F. Kelly, its witnesses, ranging from 1½ to 3½ cents a gross, it deliberately

adopted a method costing, on the testimony of E. S. Smith and Lawton, 8¼ cents, more than double more, to achieve the same results.

That it did so cut its own nose off, without the least prospect of advantage to be gained thereby, is not to be believed.

One or the other of these claims is manifestly not true. Either the defendant could not have produced these buckles at all by old, well-known, easy and non-interfering methods open to the public, or else the complainant's patented method adopted by the defendant made a saving over these methods. The defendant adopted the complainant's patented device for some purpose other than increasing expense to itself in supplying itself with these buckles.

I find, therefore, the first fact true and the last one untrue—that is, I find that by the processes known to the art in making similar brass goods open to the public to employ, requiring no invention but simply adaptation, the defendant could have made the levers, but that, so far as the defendant then knew, or could then discover or estimate, all such processes were more expensive and costly than the process invented by the complainant, and embodied in the automatic machine of the defendant employed by it to make these buckles; and I, therefore, discard as untrue altogether the defendant's evidence as to savings, which proves instead thereof such needless losings, and rely alone on the complainant's evidence as to this fact."

[Rec. p. 142]

The master having reached the conclusion before stated exceptions were filed, which are found on page 147 of the Record. With reference to these exceptions and the argument upon them Judge Shipman filed this opinion:

"I do not think that it is necessary for me to pass upon the accuracy of each one of the statements or opinions in regard to questions of fact which are given in the master's report, and to state whether I do or do not concur in each opinion. I concur in the correctness of his conclusions of law and in the correctness of his conclusions upon the question of profits. I think that his finding in regard to the amount of the defendant's savings

from the use of the plaintiff's patented machine was correct and was justified by the testimony. The whole case and the whole testimony satisfy me that the result which the defendant's witnesses sought to have the court reach would have been an inaccurate one.

All the exceptions, both of the plaintiff and the defendant are overruled, and the master's report is confirmed."

[Rec. p. 148.]

We say that Judge Shipman and the master were right, because, so far as related to the matters covered by the exceptions of the defendant, the testimony of defendant below was not credible, as a glance at it will conclusively show.

The return to the master was prepared by E. S. Smith, Treas., [Exhibit A., Rec. p. 86.] and Mr. Treasurer Smith was put upon the stand to be examined with reference to the reports rendered, including an "amended return." [Rec. p. 111.]

The following are specimens of his replies to questions:

"Int. 18. What did you pay the Andrew Terry Co. for frames? I mean, what was the price agreed upon when the goods were bought?

A. I could not say, it is so long ago.

Int. 19. What did the $1\frac{1}{8}$ inch Arctic shoe buckles cost you net?

Same objection, ruling and exception.

A. I don't know.

Int. 20. The $\frac{7}{8}$?

Same objection, ruling and exception.

A. I don't know.

Int. 21. The $\frac{5}{8}$?

A. Same answer.

Int. 22. What did the $\frac{5}{8}$ in. skate buckles cost you net?

A. Don't know.

Int. 23. You have stated, have you not, that if the profit on the rest of your business was as good as on these articles, you would be satisfied?

A. I don't know.

Int. 24. You made a good handsome profit on them did you not?

A. I don't know.

Int. 25. They cost you considerable less than the minimum price obtained for them, did they not?

A. I could not tell." [Rec. p. 88.]

See also Ints. 30-42 [Rec. p. 89]; Ints. 44-46 [Rec. p. 90]; Ints. 68, 69 [Rec. p. 91]; Ints. 236–239 [Rec. p. 105].

No wonder that in view of such testimony the master said: "I cannot find this claim to be honest, and cannot find that the defendant made no profits." [Rec. p. 141.]

The master being thus compelled to discredit the defendant's estimate, or rather, guess,—for the Treasurer of the defendant company seemed to think that his obligation to account consisted simply in replying indefinitely to such questions as he could not disregard altogether—thereupon resorted to the testimony of Mr. Sprague. The situation was peculiar in one respect. The only comparison of costs that could be made was between the patented method of production and such a method as the defendant employed after the injunction, *which the defendant claimed was old.*

Mr. Sprague put the difference between the cost of production by that method and by his patented machine at ten or twelve cents, [Sprague Dep., Int. 253, Rec. p. 106; x-Int. 290, 291, p. 109; x-Int. 295, p. 110].

The testimony of Mr. Sprague having been given, Mr. Smith again went upon the stand, and the following is a specimen of his testimony:

"Int. 330. Is the statement contained in the Exhibit Amended Statement of the Cost of Making Buckles copied from any of the estimates which have been made from time to time for use in the factory?

Ans. It is not.

Int. 331. Will you produce, for the inspection of the master the estimates of costs which have been made from time to time for the guidance of the company?

Objected to as assuming that there are such estimates now in existence that can be produced.

Ans. I will if I can find them. When we make a new estimate on any article we generally tear up former ones. We only keep on file the last estimate made.

Int. 332. Did you consult any such estimate in preparing the statement?

Ans. I did not.

Int. 333. Are any of such estimates in existence as far as you know?

Ans. I do not know of any.

Counsel for complainant calls upon the witness and defendant's counsel to produce any such estimates as may be in existence." [Rec. p. 122.]

No such estimates were ever produced.

The rule is undoubted that the complainant must make out his case. But this rule is not to be so applied as to enable a wilful infringer to practically refuse to obey the orders of the court and the master, and then take any advantage of any seeming indefiniteness in the complainant's testimony. Judge McKennan lays down the sound doctrine in a case of wilful infringement that,

"Under these circumstances the respondents ought to be held to the most rigid accountability, and no intendment ought to be

made in their favor founded upon the alleged inconclusiveness of the complainants' proof of loss. On the other hand, such proof ought to be considered and interpreted most liberally in favor of the complainants within the limit of an approximately accurate ascertainment of their damages."

[*Carpet Co. vs. Dobson*, 21 O. G. 1200.]

But we submit that the testimony of complainant, upon which he based his conclusions, was clear and definite and that the only error of the master was in finding too small an amount due the appellee—an error of which surely the appellant should not complain. The court, therefore, made no error in sustaining the master's report.

Justice according to law has been done in this case by the disposition of it in the court below, and it is respectfully submitted that the decision of the Court below should be affirmed.

C. E. Mitchell

Counsel for Appellee.

2 Sheets—Sheet 1

A. E. HOTCHKISS.

CLOCK MOVEMENT.

No. 10,062. Reissued Mar. 14, 1882.

Fig 1

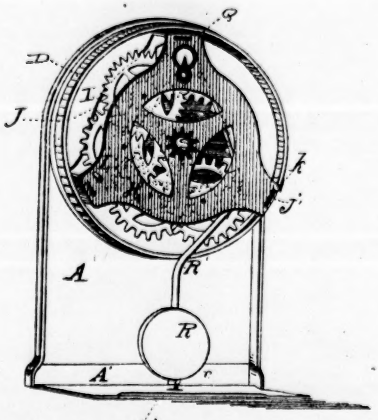


Fig 2

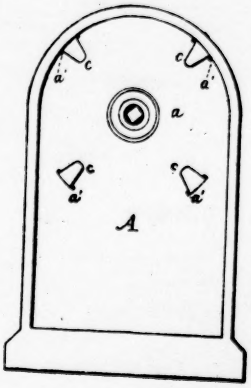


Fig 3

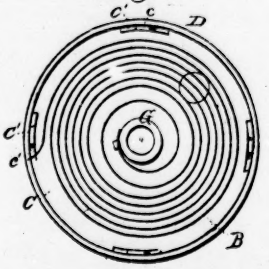


Fig 4

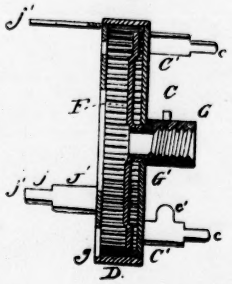
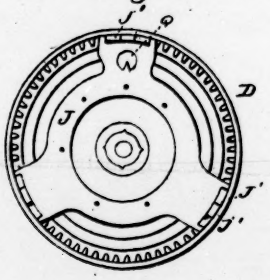


Fig 5



Witnesses
Frank P. Smith
Herbert C. Fowler

Inventor
Arthur E. Hotchkiss
by Geo. Gerry Atty

A. E. HOTCHKISS.

2 Sheets—Sheet 2.

CLOCK MOVEMENT.

No. 10,062.

Reissued Mar. 14, 1882.

Fig 6

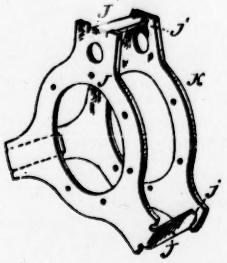


Fig 7

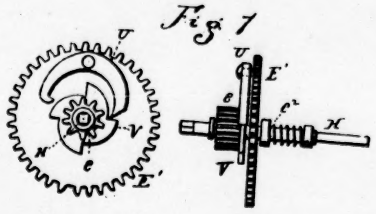
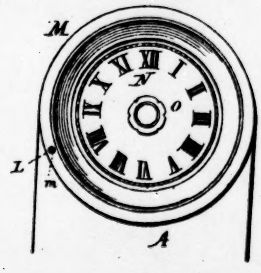


Fig 8



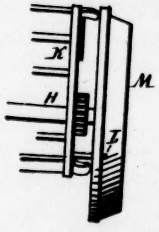


Fig 9

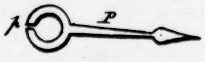


Fig 10

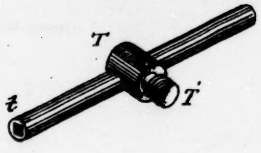


Fig 13

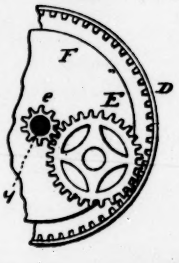


Fig 11

Fig 12

Witnesses

Frank P. Smith

Herbert E. Fowler

Inventor

Arthur E. Hotchkiss

Geo. Berry Atty

2 Sheets—Sheet 1.

A. E. HOTCHKISS.

Clock-Movement.

No. 221,310. Patented Nov. 4, 1879.

Fig. 1.

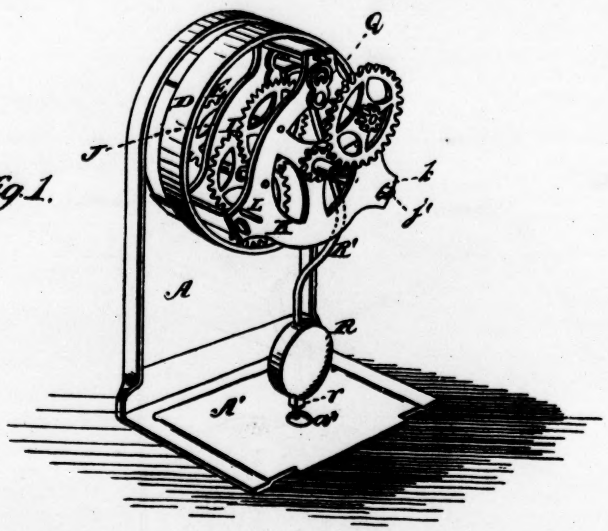


Fig. 2.

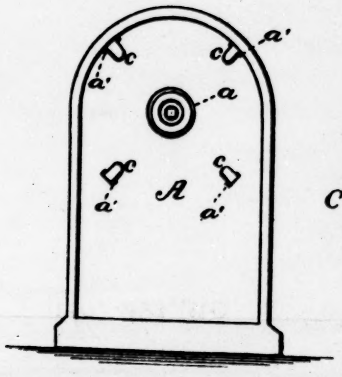


Fig. 3.

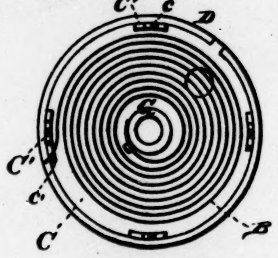


Fig. 4.

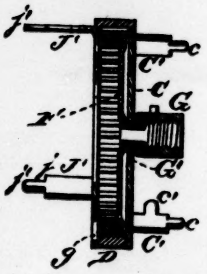


Fig. 5.

WITNESSES

Robert Burnett

N. W. Stearns

INVENTOR

Arthur E. Hotchkiss

by W. H. Babcock

ATTORNEY

2 Sheets—Sheet 2

A. E. HOTCHKISS.

Clock-Movement.

No. 221,310. Patented Nov. 4, 1879.

Fig. 6.

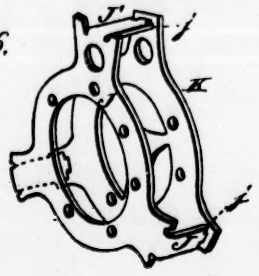


Fig. 7.

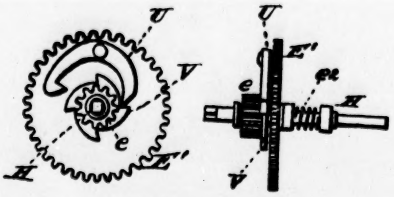


Fig. 8.

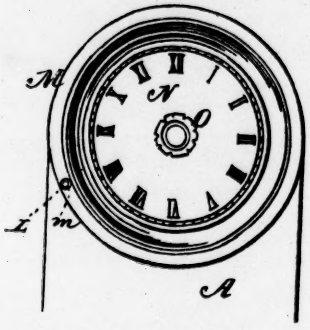


Fig. 9.

Fig. 10.

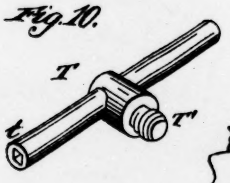


Fig. 13.

Fig. 11.

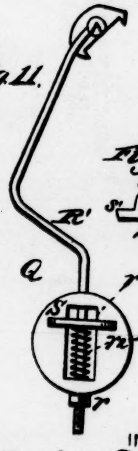


Fig. 12.

WITNESSES

Robt Everett

N. W. Stearns.

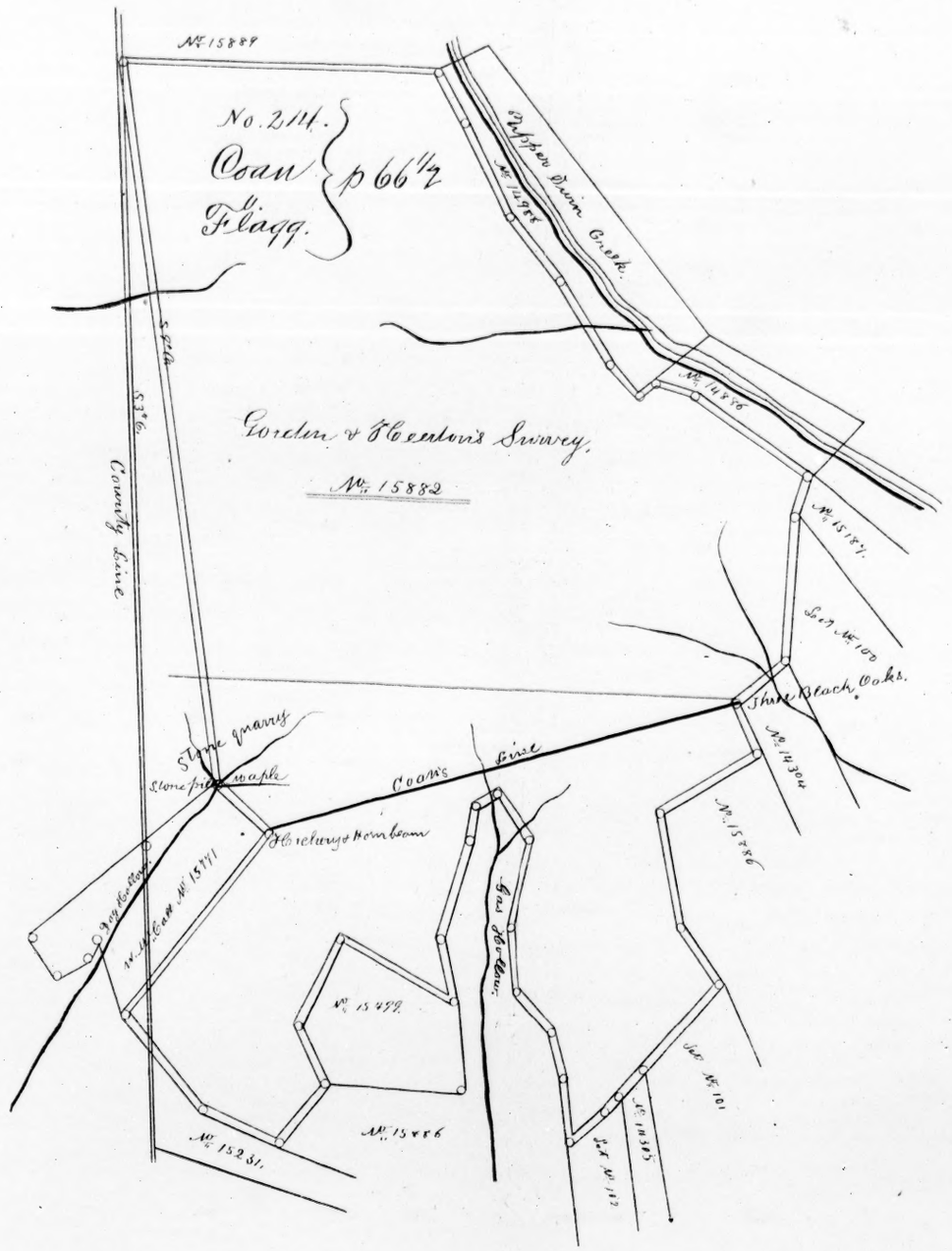
INVENTOR

Arthur E. Hotchkiss

by

W. H. Babcock

ATTORNEY


No. 211.
Coan
Flagg.
p 66 1/2
Gordon & Greenlow's Survey.
No. 15882
No. 15889
Dishpaw Drain Creek.
No. 14286
No. 15281
No. 14304
No. 15286
No. 15459
No. 15286
No. 15281
No. 14345
Lot No. 101
Lot No. 102
Lot No. 107
Shute Beach Cabs.
Stone quarry
Stone pile
Coan's line
Hornbeam
Coan No. 15771
County Line
S 2½ W

No. 340. 48.
Craig.
vs.
Leitensdorfer
} p. 619.

PLAT

OF

The Lands Awarded To

William Craig

BEING A PART OF THE

VIGIL AND St VRAIN GRANT

IN COLORADO

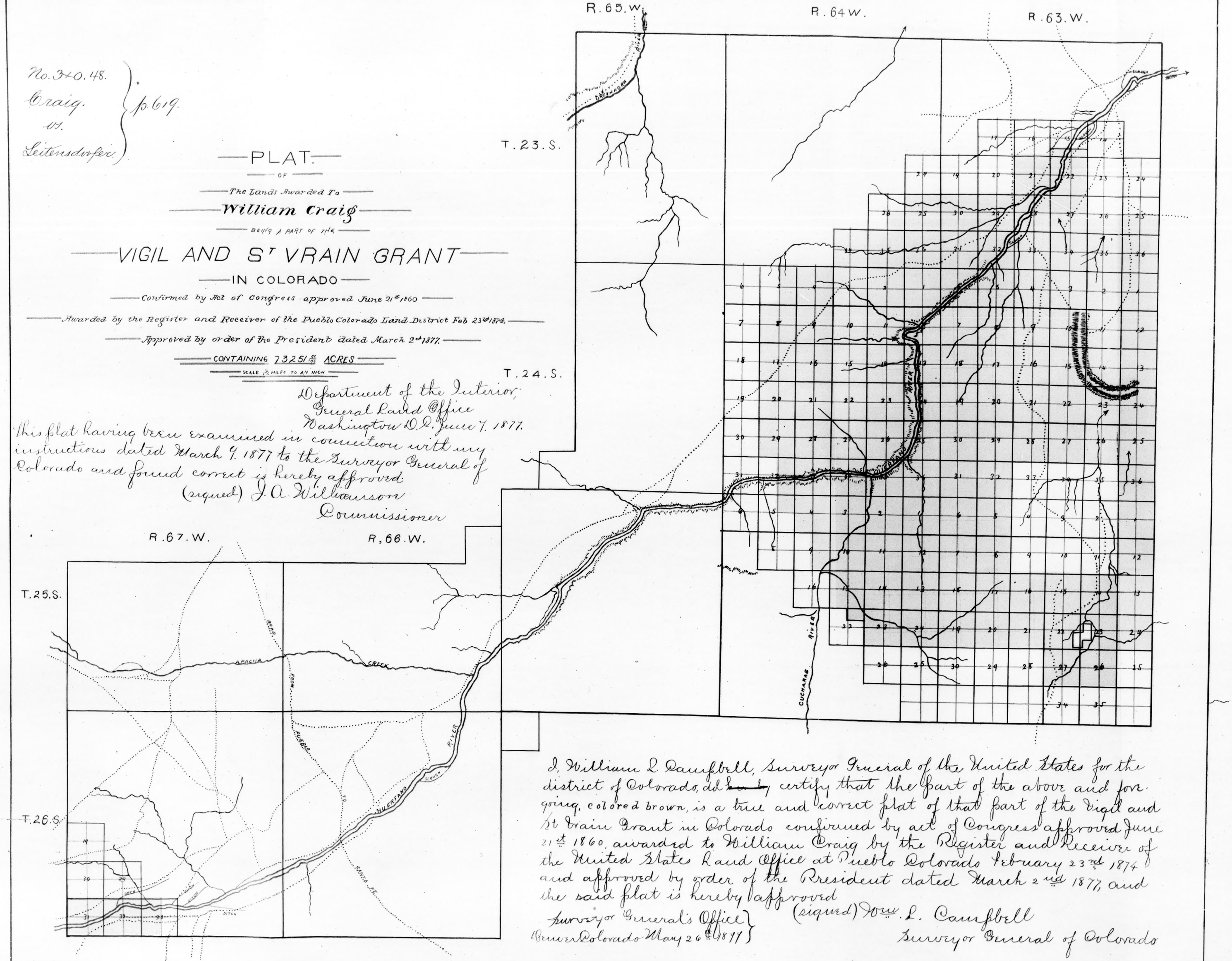
Confirmed by Act of Congress approved June 21st 1860

Awarded by the Register and Receiver of the Pueblo Colorado Land District Feb 23rd 1874.

Approved by order of the President dated March 2nd 1877.

CONTAINING 73251 55/100 ACRES

SCALE 1½ MILES TO AN INCH



Department of the Interior,
General Land Office
Washington D.C. June 7. 1877.

This plat having been examined in connection with my instructions dated March 9. 1877 to the Surveyor General of Colorado and found correct is hereby approved.

(signed) J.A. Williamson
Commissioner

I, William L. Campbell, Surveyor General of the United States for the district of Colorado, do ~~hereby~~ certify that the part of the above and foregoing, colored brown, is a true and correct plat of that part of the Vigil and St Vrain Grant in Colorado confirmed by act of Congress approved June 21st 1860, awarded to William Craig by the Register and Receiver of the United States Land Office at Pueblo Colorado February 23rd 1874 and approved by order of the President dated March 2nd 1877, and the said plat is hereby approved

Surveyor General's Office
Denver Colorado May 26th 1877

(signed) Wm. L. Campbell
Surveyor General of Colorado

No 48
~~No 370.~~
Craig
vs.
Leitensdorfer
p. 1215.

PLAT
OF
The Lands Awarded To
William Craig
BEING A PART OF THE
VIGIL AND St VRAIN GRANT
IN COLORADO

Confirmed by Act of Congress approved June 21st 1860

Awarded by the Register and Receiver of the Pueblo Colorado Land District Feb 23d 1874.

Approved by order of the President dated March 2nd 1877.

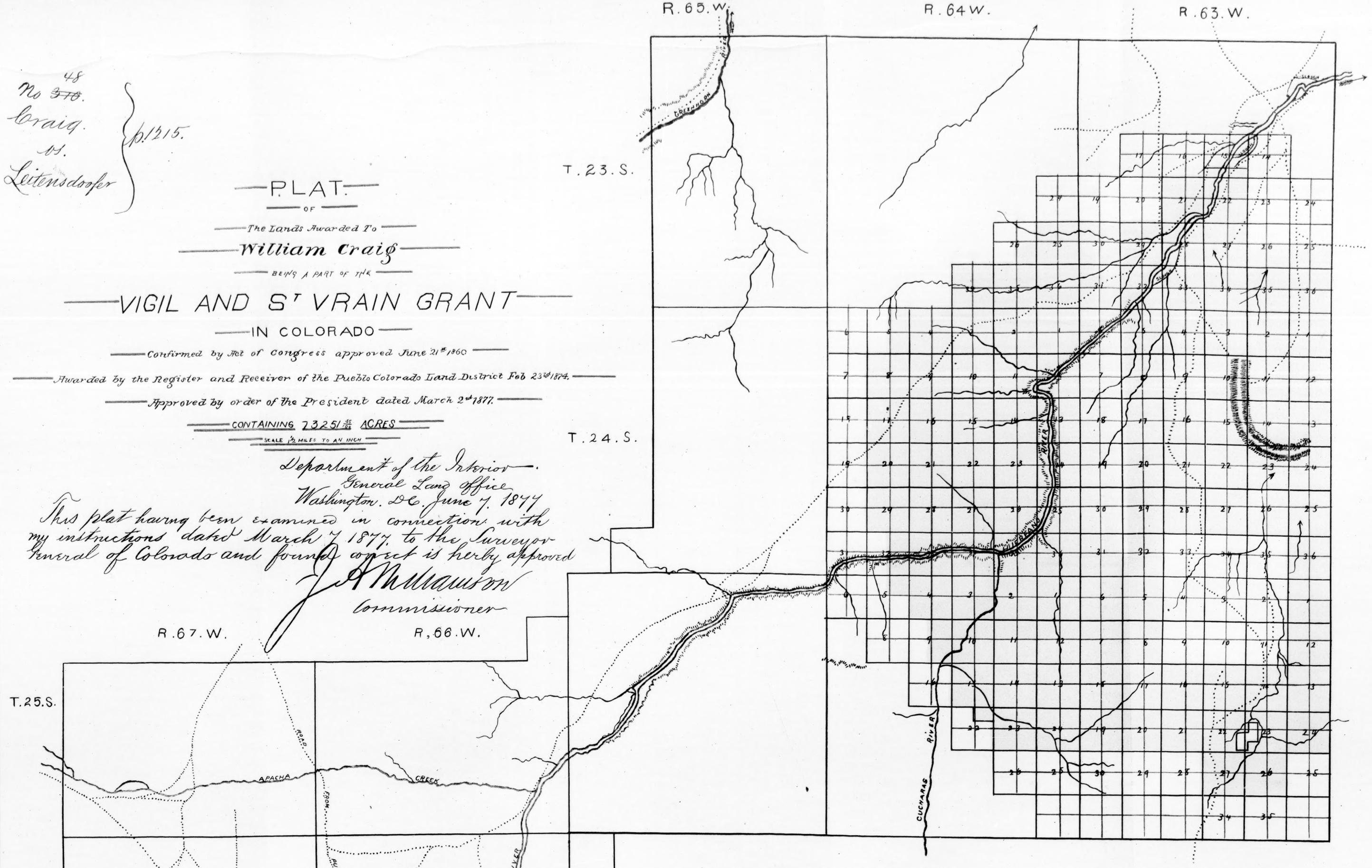
CONTAINING 7325 55/100 ACRES

SCALE 12 MILES TO AN INCH

Department of the Interior.
General Land Office
Washington. DC. June 7. 1877

This plat having been examined in connection with my instructions dated March 7 1877. to the Surveyor General of Colorado and found correct is herby approved

J A Williamson
Commissioner



I, William D. Campbell, Surveyor General of the United States for the district of Colorado do certify that the part of the above and foregoing, colored brown, is a true and correct plat of that part of the Vigil and St Vrain Grant in Colorado confirmed by act of Congress approved June 21st 1860, awarded to William Craig by the Register and Receiver of the United States Land office at Pueblo Colorado February 23rd 1874 and approved by order of the President dated March 2nd 1877, and the said plat is herby approved.

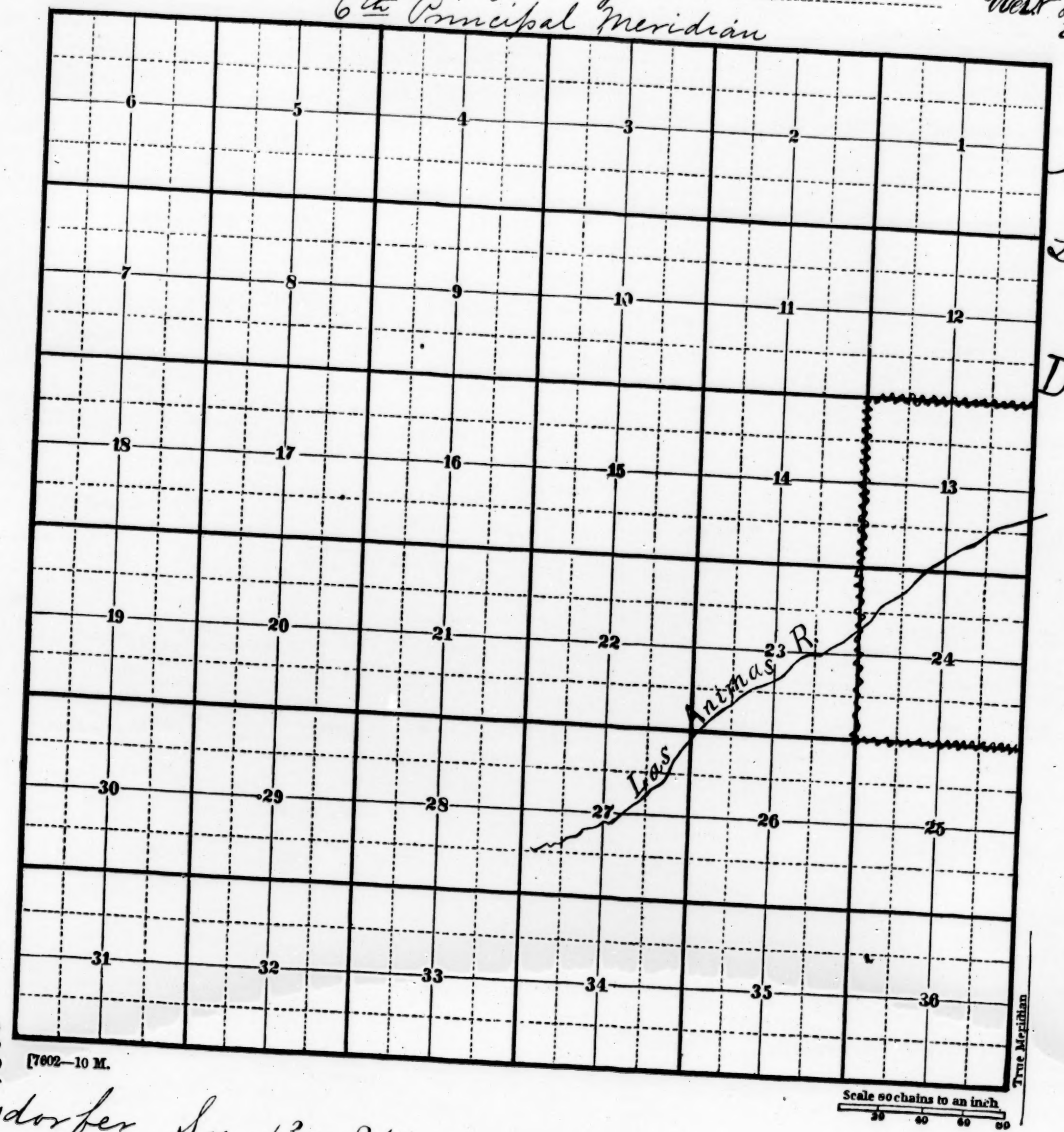
Surveyor Generals Office
Denver Colorado, May 26th 1877

Wm D Campbell
Surveyor General of Colorado

[4—590.]

740

Township No. 33 of Range No. 64 West of the 6th Principal Meridian



No. 48.
Craig
vs.
Leitensdorfer
p. 740.

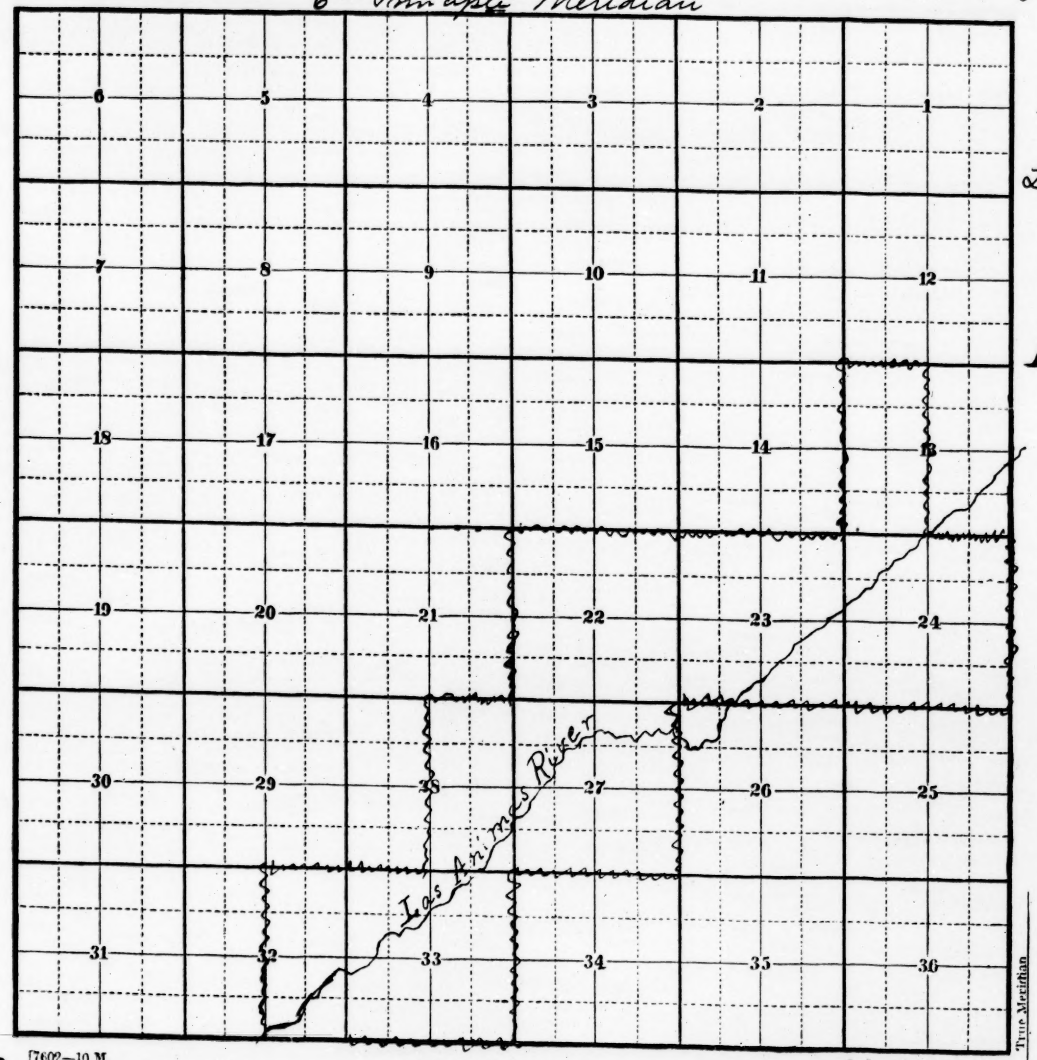
1388

[7602—10 M.

T. Leitensdorfer Sec 13-24

Township No. 32 of Range No. 63 West of the 6th Principle Meridian

no. 48.
Craig
vs.
Leitensdorfer
} p. 737



7602—10 M.

1382

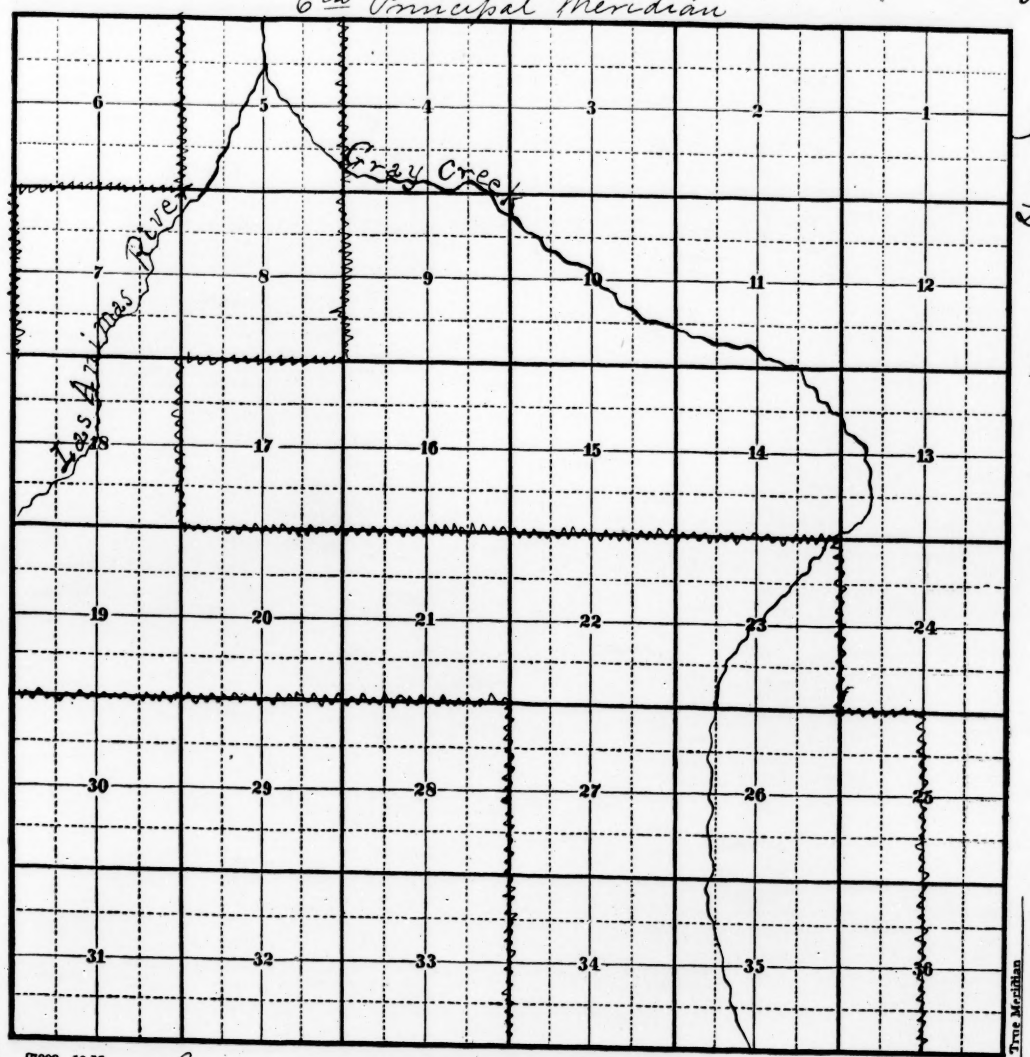
J. Leitensdorfer { W½ of Sec 13 - Sec 22 - 23 - 24 - 27 - E½ of Sec 28 - E½ of Sec 32 - Sec 33 -

T. Leitensdorfer

[4—590.]

738

Township No. 33 of Range No. 63 West of the 6th Principal Meridian



No. 348.
Craig
vs.
Leitensdorfer
} p. 738

B

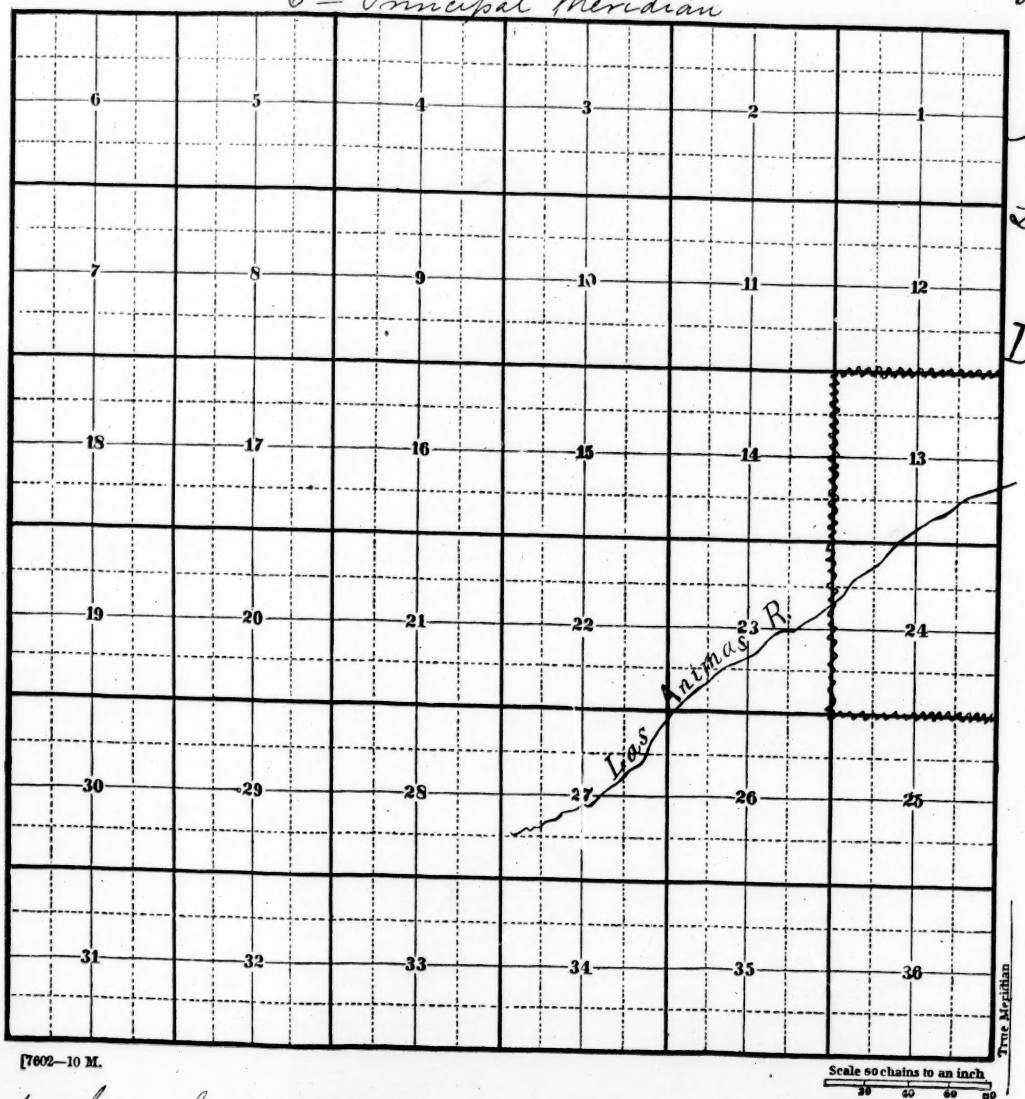
1386

[7602—10 M.

T. Leitensdorfer { Sec 5- T. 8- 18- 19- 20- 21- 22- 23- W ½ of Sec 25
Sec 26- 27- 34- 35- and W ½ of Sec 36-

740

Township No. 33 of Range No. 64 West of the 6th Principal Meridian



No. 348.
Craig
v.
Leitensdorfer
} p. 740.

1388

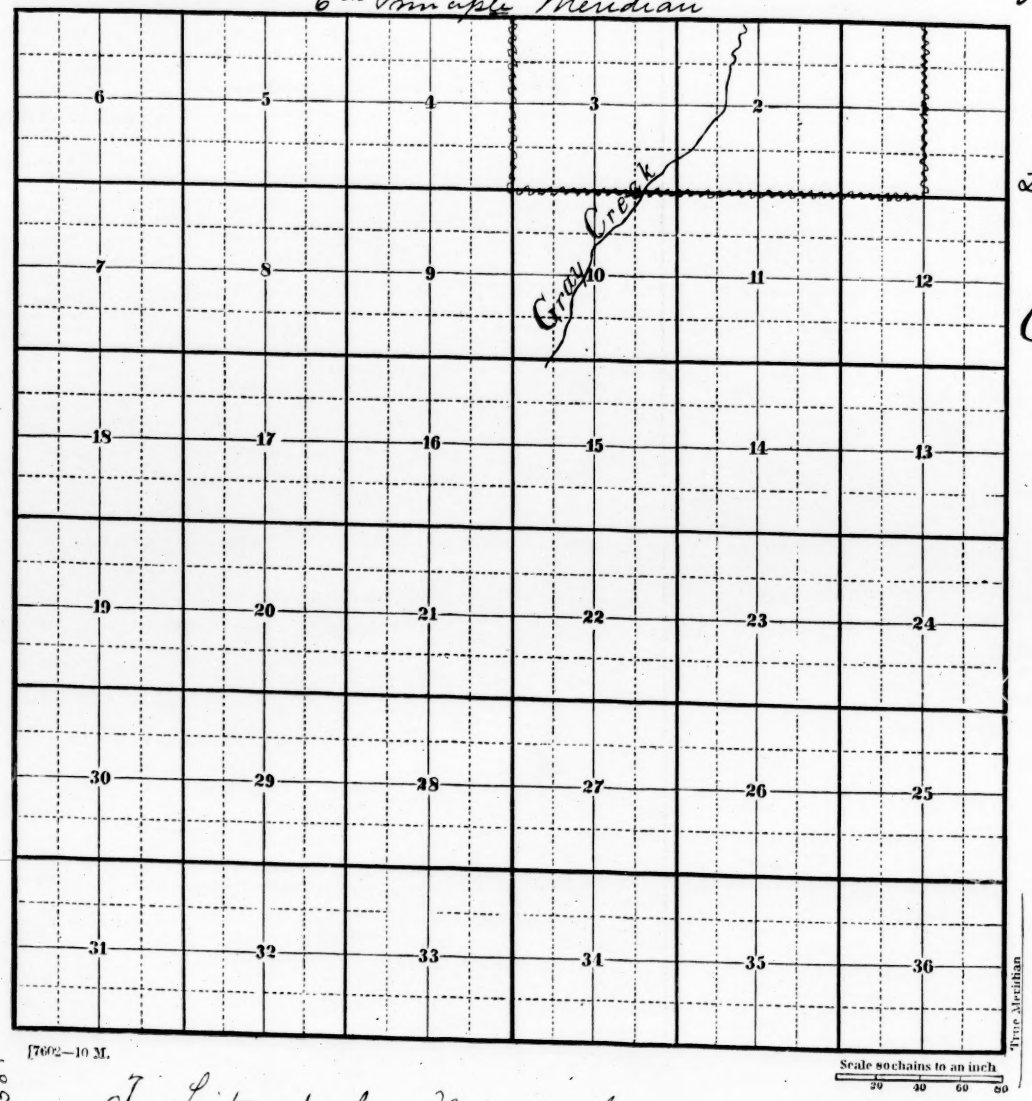
[7602—10 M.

T. Leitensdorfer Sec 13-24

[4—590.]

739

Township No. 34 of Range No. 63 West of the 6th Principle Meridian



no. 48.
Craig
vs.
Leitensdorfer
} p. 739

C

[7602—10 M.

1387

J. Leitensdorfer W. ½ of Sec 1. and Sec 2-3.

No. 48 ~~310~~
Craig
vs.
Leitensdorfer.
} 886.

N.

W.

E.

Atalaya

Arroyo Hondo

Rio Grande

Rio Pueblo

Rio Santa Fe

Rio Chama

Rio de los Barbanos

886

Mohuera en la ca
nada del huerfano

Mohuera en los limites del sur de la posesion de Gervasio Nuñez

Mohuera en los limites de la posesion de Manuel Antonio Mestas

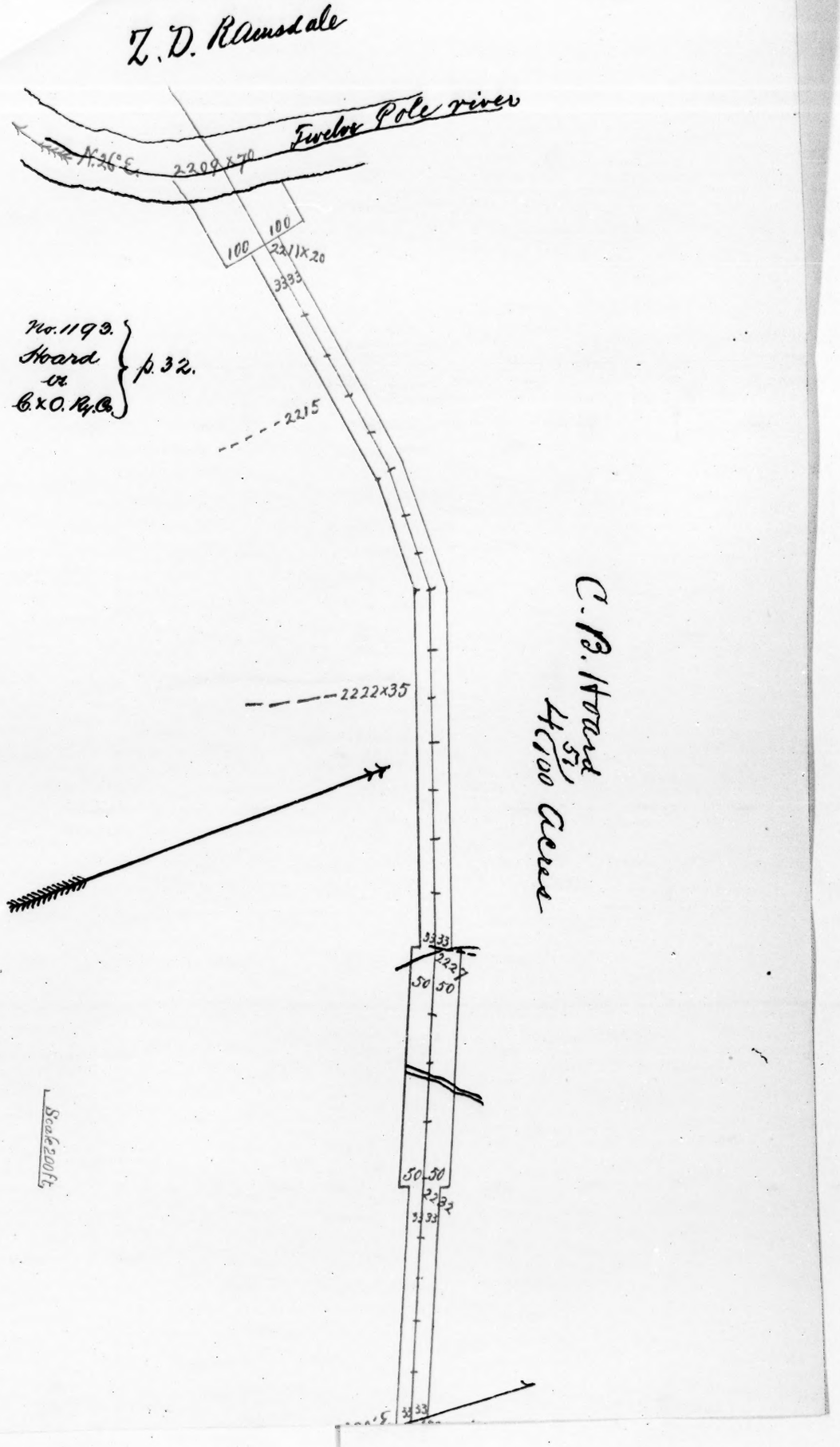
Mohuera en los limites de la posesion de Cornelio Vigil

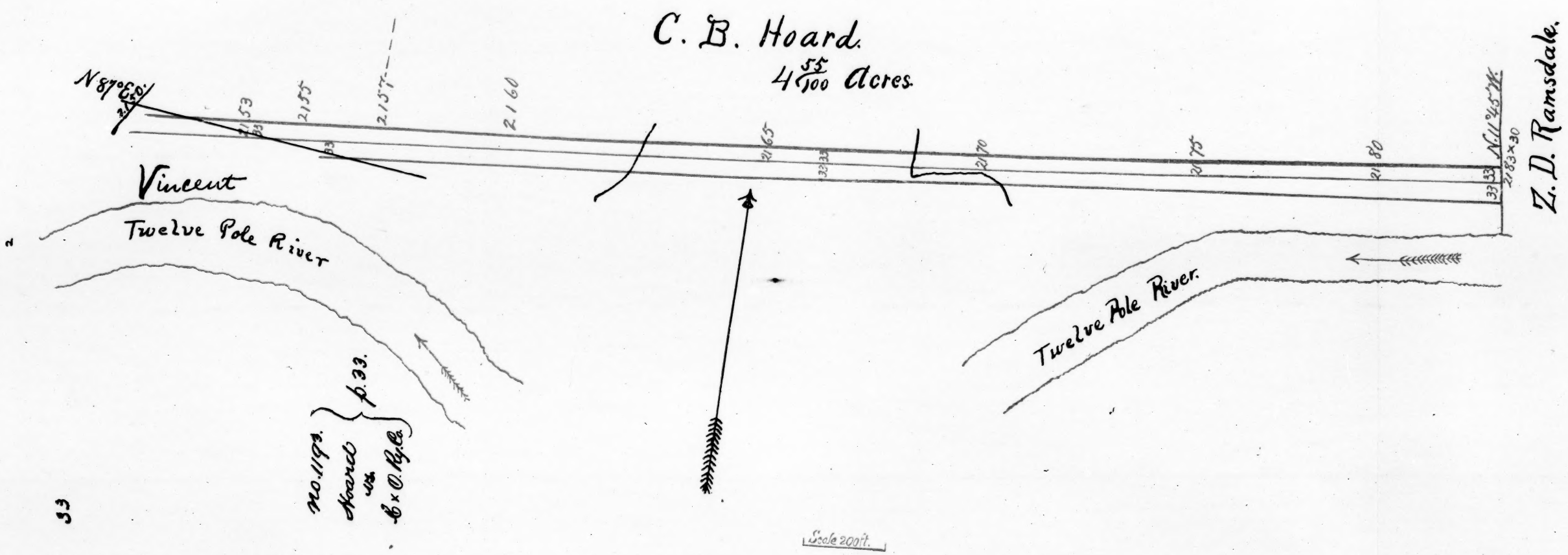
Mohuera en los limites del sur de la posesion de Miguel Antonio Otero

Mohuera en los limites del norte de la posesion de Manuel y Beaubien dada en el año de mil ochocientos cuarenta y tres.

Mohuera sobre los limites del norte de la posesion de Manuel y Beaubien en la nieve del chamisso

32


Z. D. Ramsdale
Fiveloe Pole river
N. 26° E. 2309 x 70
100
100
22 11 x 20
3333
No. 1193.
Hoard
vs.
C. x O. Ry. Co.
p. 32.
2215
2222 x 35
C. B. Hoard
47 100 Acres
3333
2227
50
50
Scale 200 ft.
50
50
2232
3333


C. B. Hoard.
4 55/100 Acres.
N 87° 00'
2153
2155
2157
2160
2165
2170
2175
2180
N. 44° 45' W.
2283 × 30
Z. D. Ramsdale.
Vincent
Twelve Pole River
33
No. 1193.
Hoard
vs.
B & O Ry. Co.
p. 33.
Twelve Pole River.
Scale 200 ft.